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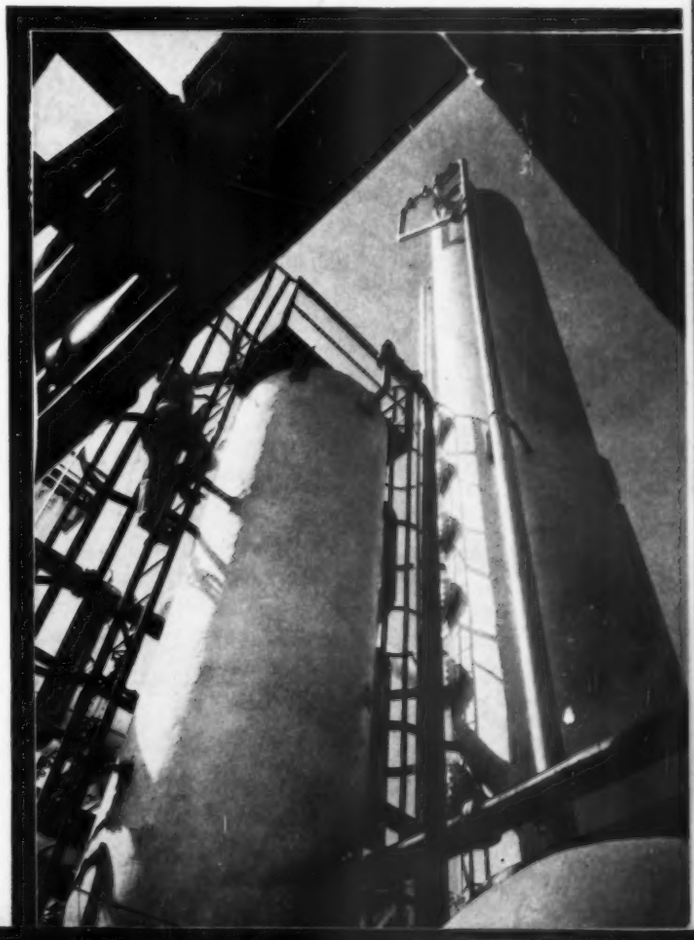

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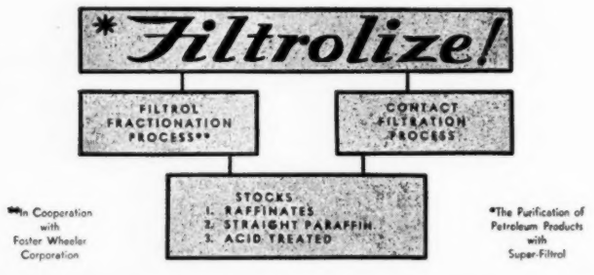

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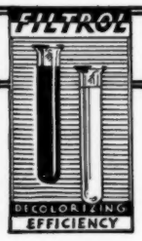

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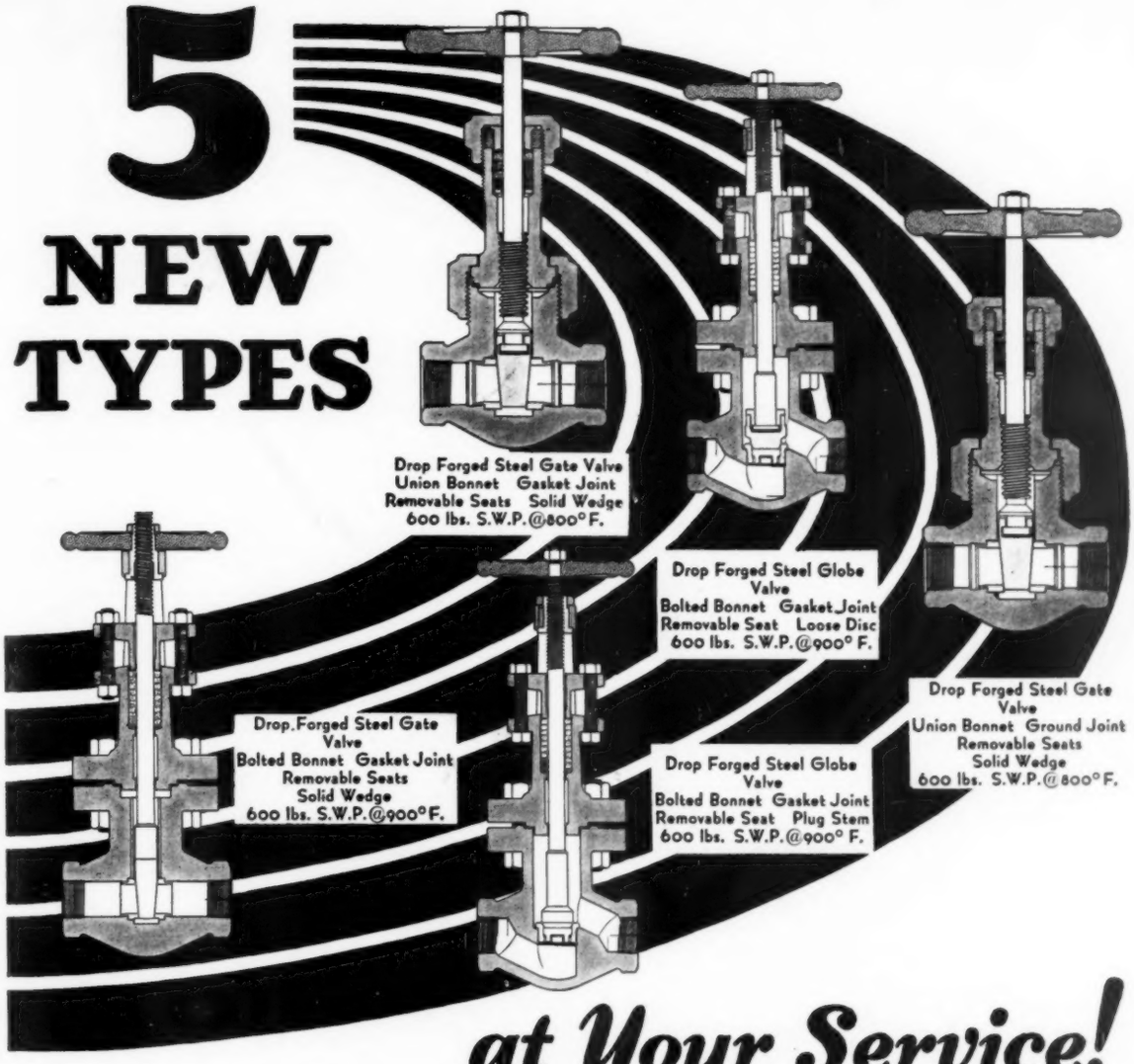

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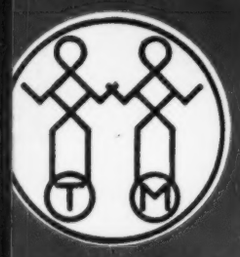

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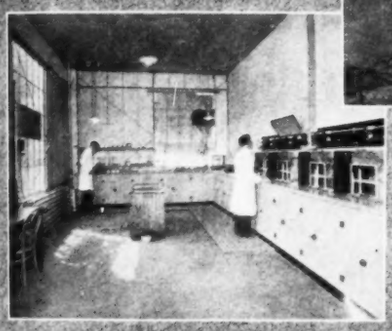
Our new plant recently completed near Gladewater, Texas, with a capacity of 35,000 gallons per day, processing the gas from more than 1,000 oil wells.



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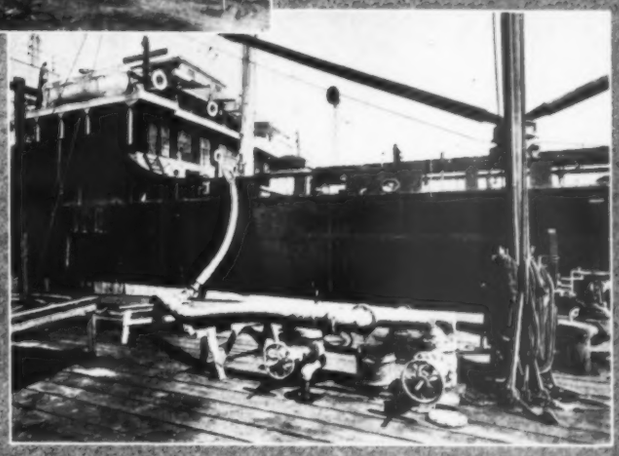

Loading Natural Gasoline aboard a modern tanker at our Houston Terminal, quite a contrast from the "Martha" of 1909.

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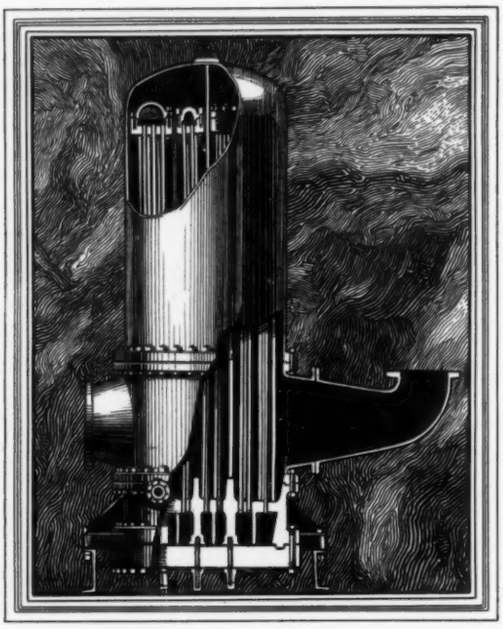

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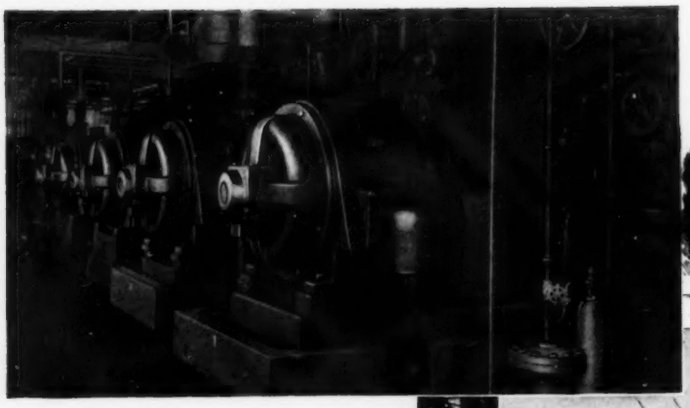
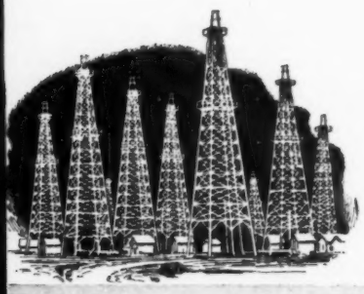
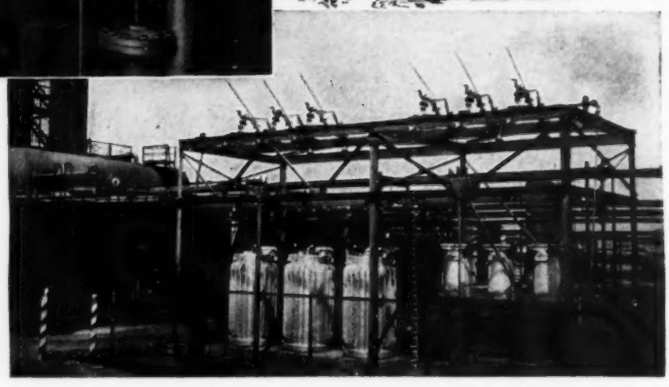


G-E motors driving oil pumps in a large oil refinery at Aruba, D.W.I.





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100%	88.8%	65.9%
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* **PERFORMANCE** means *speed* at top of the test hill in the case of those cars that were able to reach the top in high gear; in the case of those cars which had to shift to second, *distance* on hill made in high gear.

Study these figures in terms of your own car. Consider also another point these tests brought out: objectionable knocking and higher radiator (cooling water) temperatures accompanied the power losses when regular and third grade gasolines were used.

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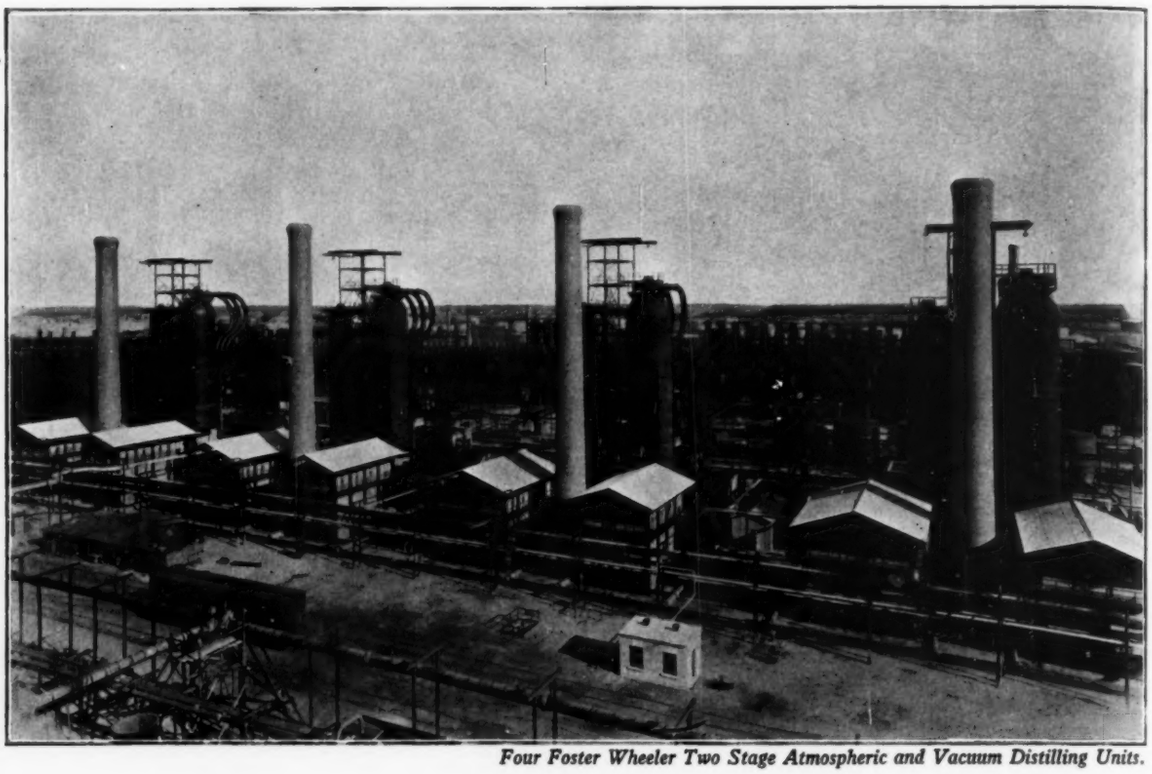

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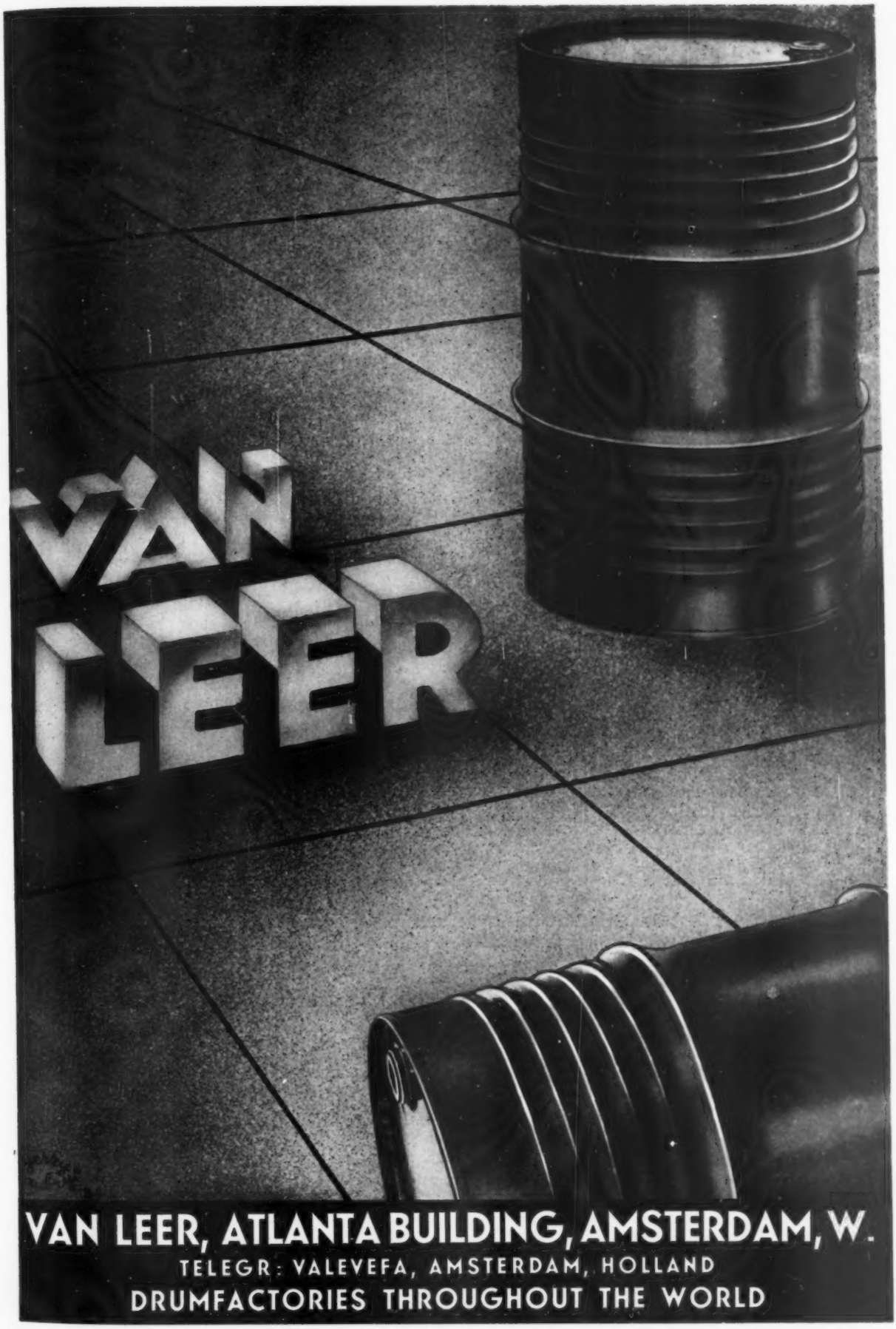

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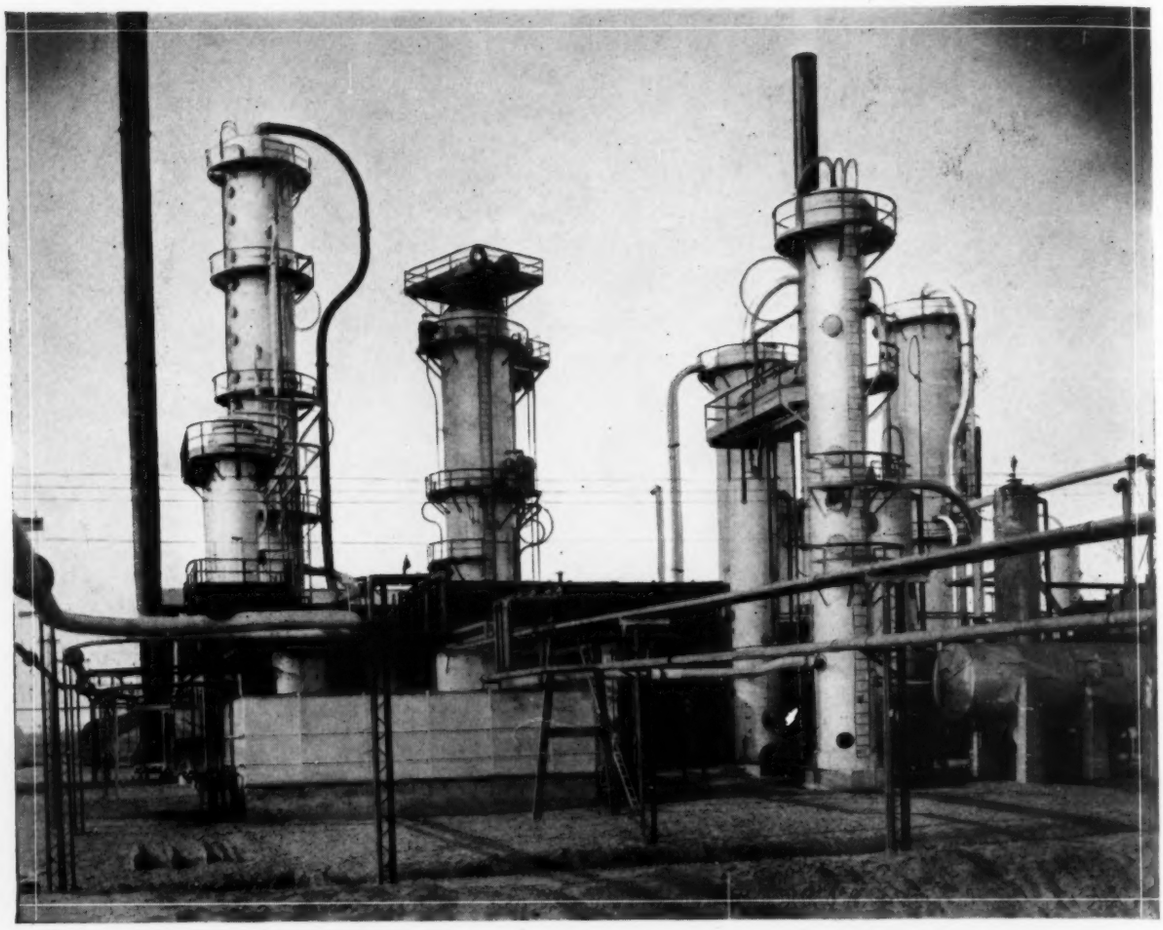

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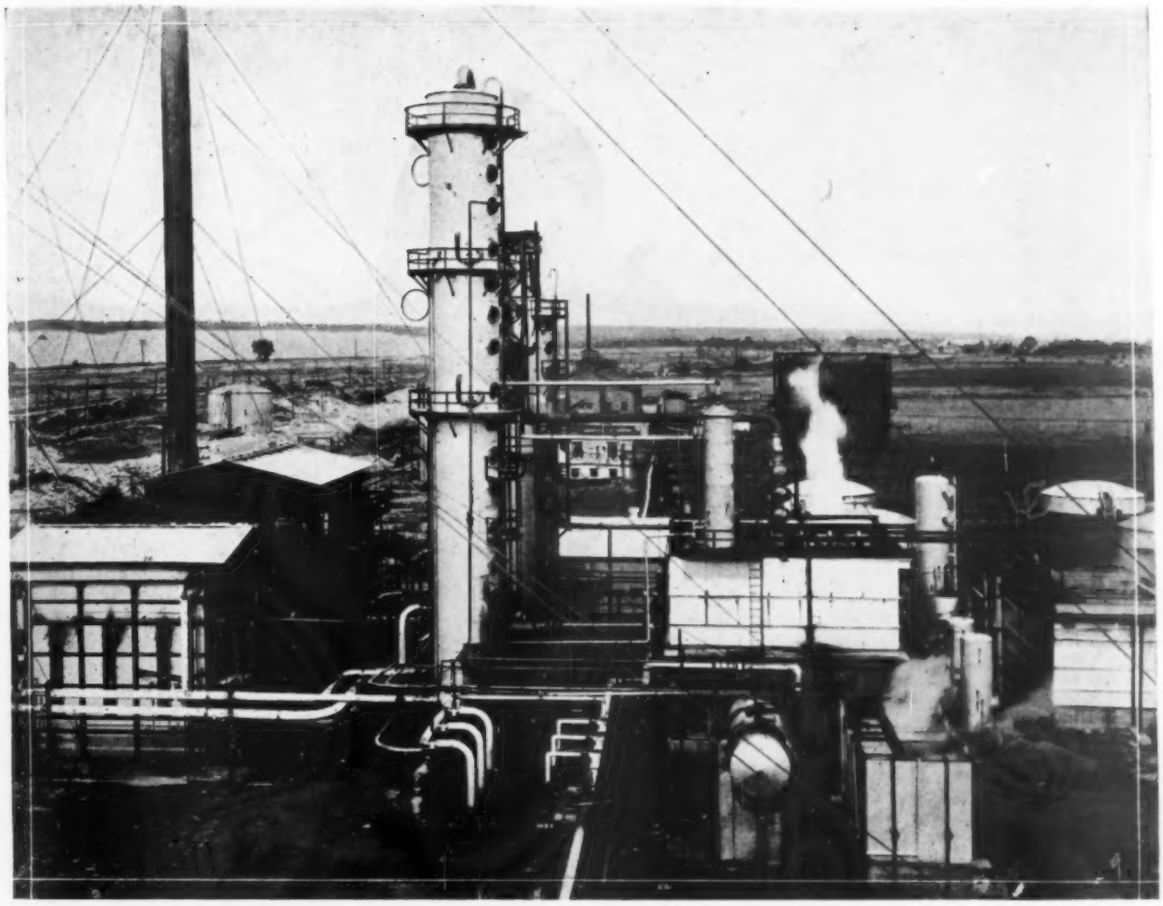

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can be obtained only from bricks which have been developed to meet the conditions obtaining in modern industrial furnaces — bricks which are maintained at a consistently high standard by technical control.

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STEIN GLASGOW-	34/36%	„
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The pump room in a Canadian refinery of Shell Oil, Limited, equipped with Westinghouse Explosion-proof Motors.

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makes Westinghouse Explosion-proof Motors the Choice of Refinery Operators

Approved by the Underwriters' Laboratories for Class I, Group D., Hazardous Locations.

THE Westinghouse Explosion-proof Linestarter for use in locations where explosive gasses are present. It is available with switch built into the cover, or

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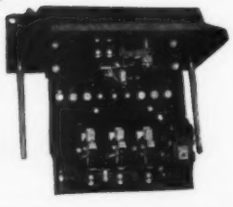
THE Oil-Immersed Explosion-proof Linestarter. All of the contacts are immersed in oil, but the relay heaters



are above the oil level to assure accurate calibration for overload protection. The oil film covering all parts within the enclosure protects them from corrosion. Designed for use in locations where corrosive, as well as explosive, gasses are present.

There is no longer any question as to the good common sense of using explosion-proof motors and control for refinery work. The only question is: *What* motors and *what* control?

That is where Westinghouse steps into the picture — with the Westinghouse Dual-ventilated, Double Cast-iron Explosion Tested Motors, and Westinghouse Explosion-proof Linestarters—approved by the National Board of Fire Underwriters for Class I, Group D hazardous locations.

The dual method of ventilation permits rapid dissipation of heat by providing separate paths for the internal and external cooling air. This is an advantage, especially in the larger sizes, because it keeps the motors comparable in size to the open types. Thorough sealing makes them completely explosion-proof and the double cast-iron construction makes them highly resistant to corrosive fumes and moisture.

For use in refineries and other hazardous locations, two types of explosion-proof linestarters are recommended—the air break type and the oil-immersed type. Both types are strongly built to resist internal explosion, and a surprising feature of the oil-immersed starter is that the case is fully explosion-proof, even though the oil, through error, might be omitted.

Westinghouse will gladly furnish you with complete information on the motors and control that will best meet your requirements. Consult the Westinghouse representative nearest you, or write to:

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Cracking Development

Most refinery equipment was obsolete before it was put into operation. Facts have been obscured by an excess of technical phraseology and an insistence on special equipment and features which are not fundamental but merely incidental.

With the present world-wide demand for high-grade gasoline it is conceded in all scientific, engineering and technical circles that

VAPOR PHASE CRACKING is the CRACKING OF TODAY & TOMORROW

TVP IS True Vapor Phase, the best process available to the refiner.

Over 100,000,000 gallons of TVP gasoline have been produced by one major oil company and every gallon has been used to improve straight-run and liquid-phase cracked gasoline. This is commercial proof of the supremacy of TVP.

Recently on a continuous run of 75 days the TVP unit produced from eleven different kinds of charging stock over 10,300,000 gallons of finished gasoline having an octane rating of 72·5 by the motor method. This demonstrates the commercial flexibility of the TVP Process. **No other process has ever done this.**

The fuel oil residuum was 15°API and had a Saybolt Universal viscosity of 74 seconds of 100°F. **No other process can equal this record of gasoline and fuel oil quality.**

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The TVP Process,
c/o Société des Établissements Barbet,
14, Rue la Boëtie, Paris (8e), France.
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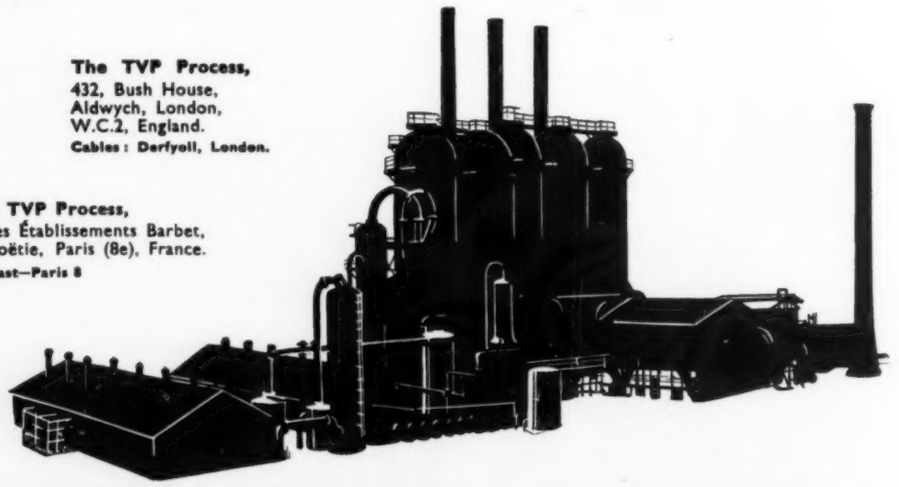

Perfezionamento del Processo di Conversione

LA maggior parte del macchinario per la raffinazione era già antiquato prima che fosse messo in uso. I fatti sono stati oscurati da un eccesso di frasologia tecnica ed un'insistenza per macchinario speciale e congegni che non sono fondamentali ma semplicemente incidentali.

Stante la domanda in tutto il mondo per della gazolina d'alto grado in tutti i circoli scientifici, meccanici e tecnici è riconosciuto che la

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il Processo di Conversione dell'oggi e del Domani

TVP È la Conversione a Fase di Vapore il miglior processo per il Raffinatore. Più di 100,000,000 galloni di Gazolina TVP sono stati prodotti da una delle più grandi compagnie Petroliere, ed ogni gallone è stato usato per migliorare della Gazolina convertita ottenuta con fase liquida e periodo continuo. Questa è la prova commerciale della supremazia della TVP.

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Telegrammi: Derfyoil, Newyork

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Inghilterra.
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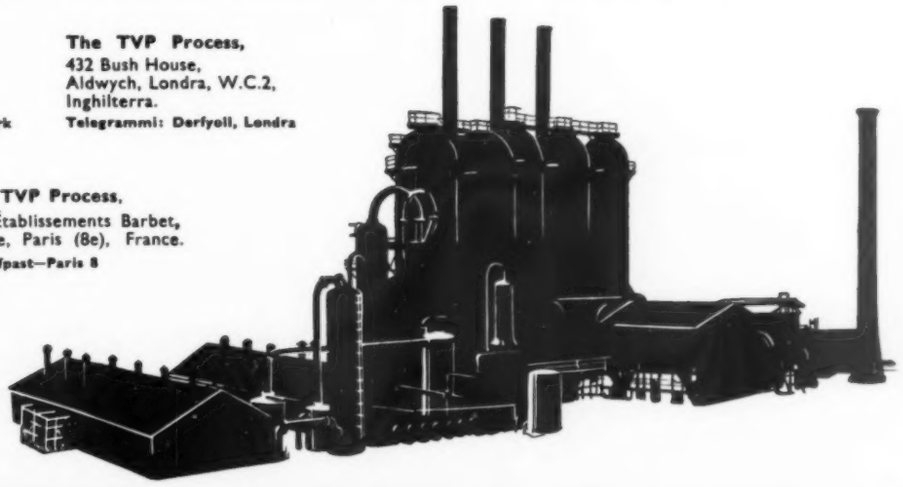
The TVP Process,
c/o Société des Établissements Barbet,
14, Rue la Boëtie, Paris (8e), France.
Telegrammi : Réctifpast—Paris 8



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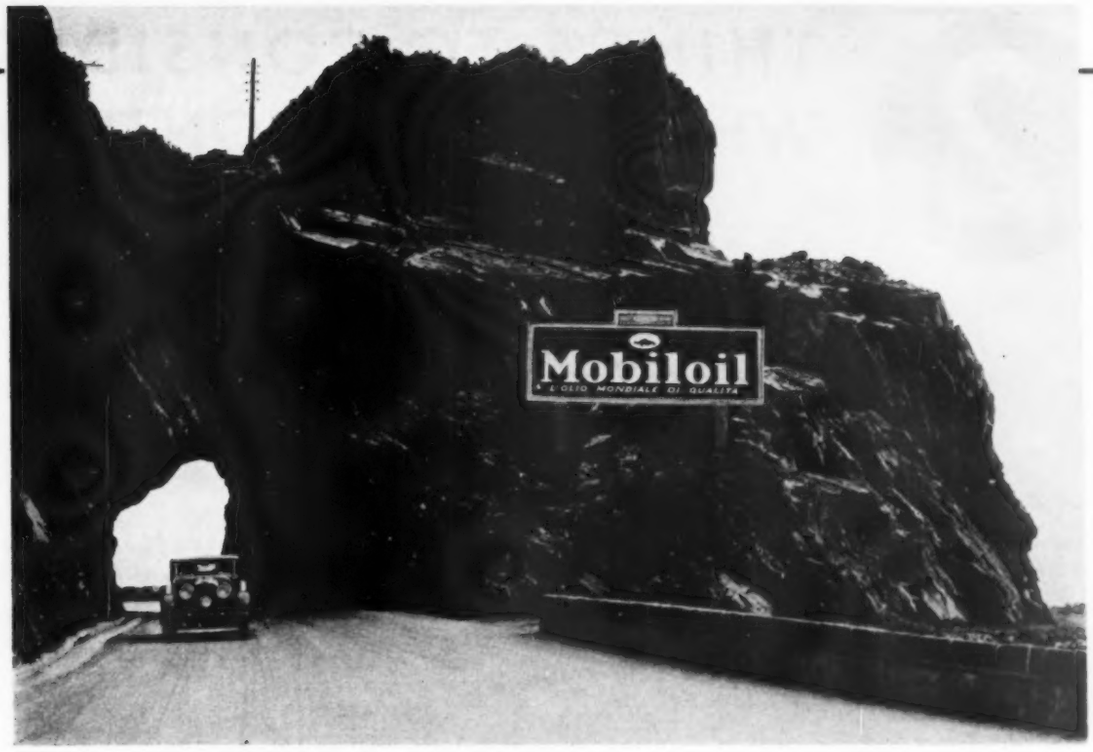

Lungo le magnifiche strade che il Regime Fascista ha dato all' Italia, il Mobiloil ha posto al servizio dell' automobilismo una fitta rete di distribuzione, contribuendo alla facilità di rifornimenti anche nelle località più remote.

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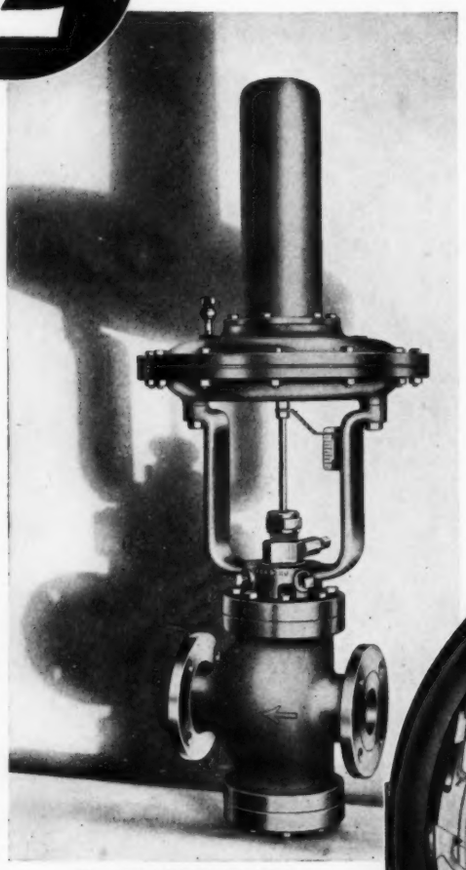
2 THINGS TO CONSIDER WHEN BUYING CONTROL

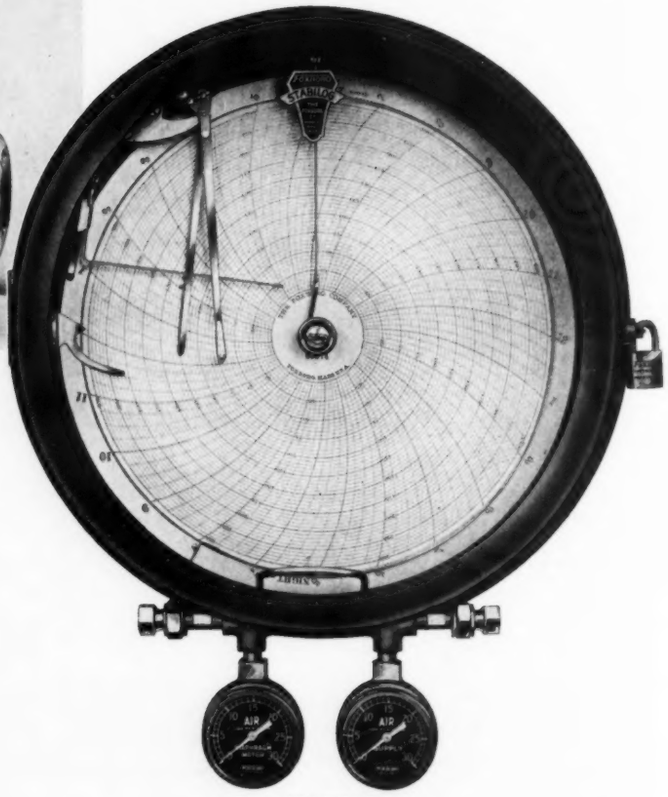


The STABILFLO Valve

Designers and operators of refineries should consider both the instrument and the controlled valve when purchasing *complete control.*

The STABILOG and the STABILFLO Valve operate perfectly as a unit for producing one hundred per cent automatic control. Each has every modern design advantage required for good control and together they form the perfect control system.

Refiners throughout the world know that this combination means higher yields, fewer reruns and a great reduction in the time wasted in balancing out the unit. You should consider what it will do for you. Write for Bulletin 175.



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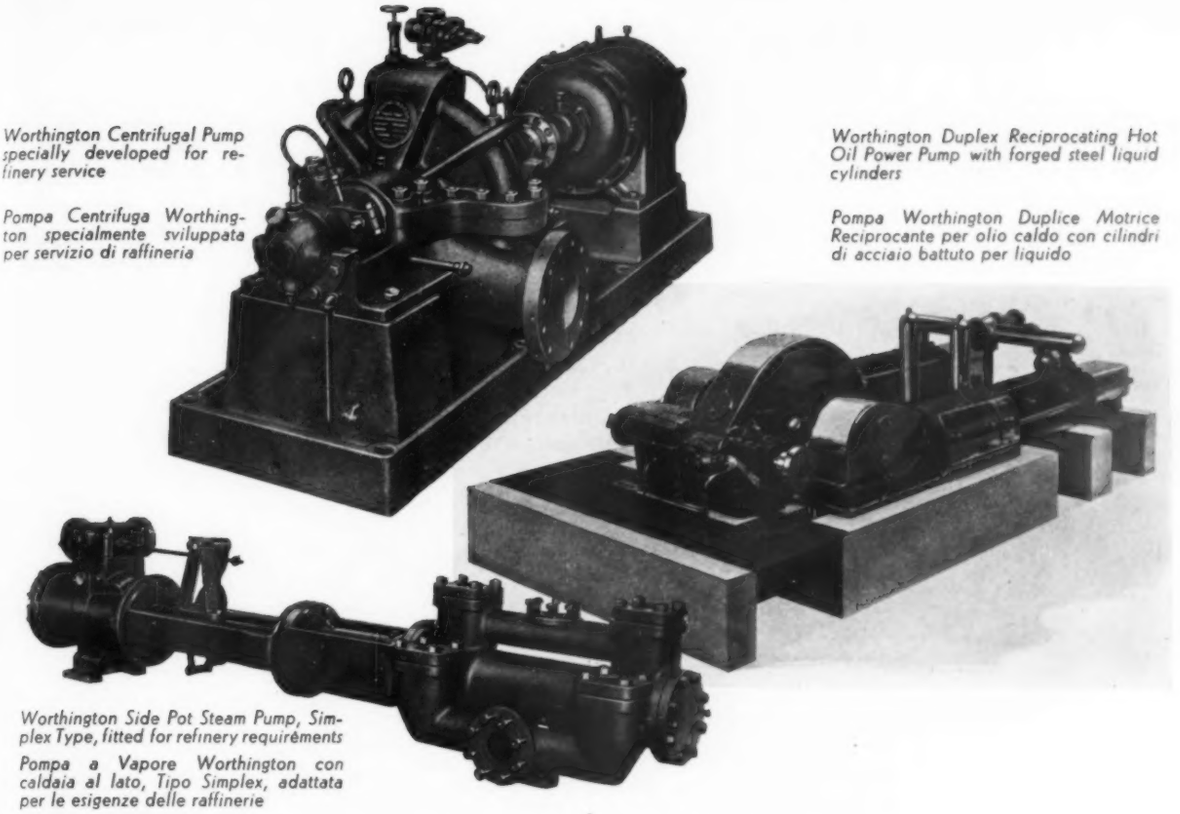

Worthington Centrifugal Pump specially developed for refinery service

Pompa Centrifuga Worthington specialmente sviluppata per servizio di raffineria

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Worthington Side Pot Steam Pump, Simplex Type, fitted for refinery requirements

Pompa a Vapore Worthington con caldaia al lato, Tipo Simplex, adattata per le esigenze delle raffinerie

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throughout the world

REFINERIES everywhere are using Worthington Pumping Equipment. A complete line . . . steam pumps, power pumps, centrifugal pumps . . . in a wide range of special designs and materials . . . for every type of drive . . . provides the correct unit for each of the exacting refinery requirements.

Worthington Diesel and Gas Engines, Air and Gas Compressors, and Steam Power Plant Equipment round out a comprehensive offering to refineries.

And manufacturing facilities on the Continent, in England and in America enable Worthington to meet the demand for locally-built equipment.

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LE RAFFINERIE dappertutto usano delle Pompe Worthington. Una linea completa . . . pompe a vapore, pompe a forza motrice, pompe centrifughe . . . in una larga scelta di disegni speciali e di materiali . . . per ogni tipo forza motrice . . . supplisce l'unita' corretta per ognuna delle piu' esatte esigenze delle raffinerie.

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E le facilita' di manifattura sul Continente, in Inghilterra ed in America rendono abile la ditta Worthington di supplire alle richieste per macchinario costruito localmente.

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Specialità raccomandate per la pitturazione di serbatoi, carri cisterna, recipienti ecc., usati nell'industria del petrolio.

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Ultima mano a finire in alluminio, qualità superiore, applicabile a serbatoi per benzina, colonne di distribuzione ecc.; conserva per lungo tempo una grande brillantezza.

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Pittura lucida di lunga durata, adatta per serbatoi, finiture murali interne, mobilio ecc. Sostituisce vantaggiosamente gli smalti. Fornita in qualunque tinta desiderata.

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Intonaco anticorrosivo, resistente a tutti i derivati del petrolio. Indicato per la pitturazione interna dei serbatoi, carri cisterna d'ogni tipo, barili, stagnoni, cilindri metallici ecc.

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Composizione resistentissima ai derivati del petrolio; specialmente raccomandata per l'applicazione nei giunti delle lamiere.

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Il più recente ritrovato resistente alle corrosioni prodotte dal petrolio e suoi derivati, nonchè alle sostanze alcooliche in genere.

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"DANBOLINE-SILVERETTE"

A high grade aluminium finish for tanks. Maintains a fine lustre for long periods.

"LAGOLINE"

A glossy, durable paint suitable for tanks, houses and general work. May be washed, and is obtainable in all shades.

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An anticorrosive coating resistant to all petroleum and coal tar products. For use inside tanks, road or rail cars, barrels, drums, etc.

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A petroleum resisting compound for use on joints and seams.

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A more recent jointing compound resistant to petroleum derivatives and alcohol either singly or together.

These materials are obtainable from the following "International" Companies, as well as from our Associate Company at Genoa—(see opposite page).

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Messrs. Holzapfel Farbenwerke G.m.b.H., Slomanhaus, Steinhoft 11, Hamburg, GERMANY.

Messrs. International Composition & Farvefabrik A/S, Bergen, NORWAY.

Messrs. Cia Espanola de Pinturas "International" S/A, Calle Ibanez de Bilbao No. 8, Bilbao, SPAIN

Messrs International Compositions Co. Inc. 21, West Street, NEW YORK, U.S.A.

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Messrs. Goshi Kaisha Bankoku Toryo Seizosho, Crescent Buildings, 72, Kyomachi, Kobe, JAPAN.

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MAIN FACTORY—Felling-on-Tyne, ENGLAND.

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Petroleum products of Socony-Vacuum or its affiliates are marketed in practically every country of the world.

SOCONY-VACUUM OIL COMPANY

INCORPORATED

NEW YORK

The present day Gyro Vapor Phase Cracking Process is the result of fifteen years of research and development. During the past ten years many plants have been built and operated with the result that valuable engineering data are now available for the design of new and efficient units.

The Gyro Process is licensed through Alco Products Inc., New York City.

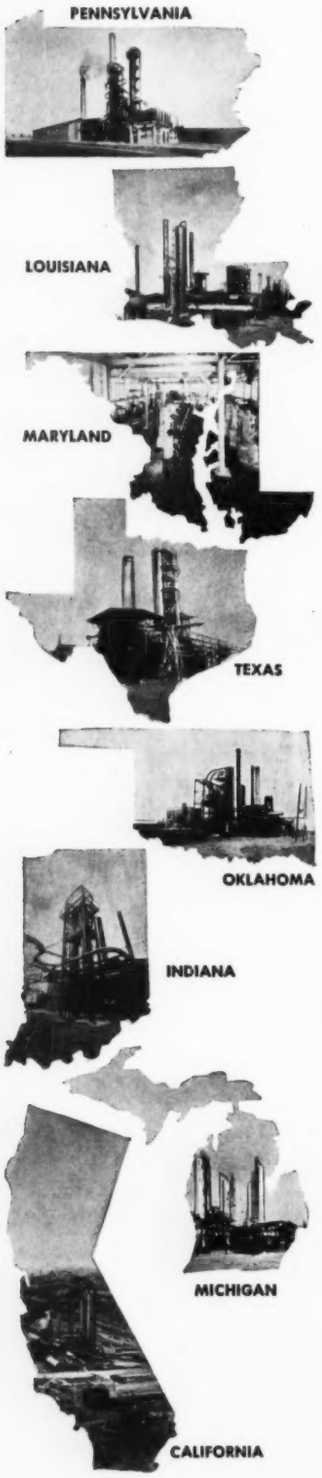
GYRO PROCESS COMPANY

DAVID STOTT BLDG., DETROIT, MICHIGAN

ALCO REFINERY ENGINEE

FOUR years association with the International Petroleum Industry have demonstrated the acceptance by the industry of ALCO Products, Incorporated, as refinery engineers and constructors.

Accessory equipment such as Heat Exchangers, Towers, Alco designed and built, have been supplied to refiners in almost every state of the U. S. A. as well as to countries throughout the world.



PENNSYLVANIA—Two 1,500 bbl. and one 2,000 bbl. Alco Single Stage Atmospheric Units—charging Pennsylvania Crude; a 250 bbl. High Vacuum Distillation Unit charging a special petroleum cut for the production of lubricating specialties; a 3,000 bbl. and one 2,000 bbl. Pressed Wax Distillate and Cylinder Stock Solution Unit; and a 40,000 gal. Propane-Butane Recovery Plant using vapor recovery plant residues as the charge—represent some Alco installations in this state.

•

LOUISIANA—Two Alco Gyro Cracking Units with a total daily capacity of 10,000 bbls. charging East Texas Reduced Crude are in service here. Alco Gas Recovery, Stabilization, and Polymerization Plants also are included with this installation. Other Alco installations include an Osterstrom type Clay Treating Plant and a Rerun Unit.

•

MARYLAND—Recent Alco installations are a 4,000 bbl. Stratford Acid Treating Plant for processing high sulphur cracked distillate, and a 3,000,000 cu. ft. Alco Gasoline Absorption and Stabilization Plant.

•

TEXAS—Here, Alco has designed and built a 4,000,000 cu. ft. Vapor Recovery Plant charging cracking unit gases; a 6,000,000 cu. ft. Vapor Recovery Plant charging refinery vapors; a Stabilization Plant; a 6,000 bbl. Distillation Unit charging Van Zant Crude; and major equipment for a 15,000,000 cu. ft. Natural Gas Absorption Plant.

•

OKLAHOMA—Alco installations include a 3,000 bbl. Pressed Wax Distillate Plant, and a 5,500,000 cu. ft. Vapor Recovery Plant charging Gyro, Cross, and refinery gases. The Distillation Plant is characterized by several innovations for the automatic control of the withdrawal of products from the fractionating tower.

•

INDIANA—A Debutanizing Plant; a 10,000 bbl. Pressure Distillate Fractionating Unit charging Dubbs pressure distillate; and a 41,300 bbl. Alco Stabilizer with pressure distillate overhead—represent recent Alco installations.

•

MICHIGAN—Alco designed and built a complete 3,500 bbl. Gasoline Refinery charging Michigan Crude. This installation refines high sulphur Michigan Crude and produces special Naptha cuts for rubber solvent work in addition to low sulphur gasoline, gas oil, and high quality fuel oil. It includes a complete boiler plant, tankage and accessory equipment.

•

CALIFORNIA—Alco installations in this state include a Pressure Distillate Stabilization Plant charging 10,000 bbls. of pressure distillate for the recovery of all liquefiable hydrocarbons. This unit is designed for maximum efficiency and minimum fuel requirements.

NG AND CONSTRUCTION

CANADA—Two Gasoline Vapor Recovery Plants charging 2,000,000 cu. ft. of gas per day, and a 100,000,000 cu. ft. Natural Gas Absorption Plant with a 74,000 gal. Stabilizer, are outstanding Alco installations.

•

MEXICO—A 2,000 bbl. Alco Gyro Cracking Unit for processing Pressed Wax Distillate and Gas Oil is installed here. Also, a large Gas Absorption and Stabilization Plant and a 7,500 bbl. Reduced Crude Distillation Unit charging Asphaltic Naranjous Crude.

•

ARGENTINA—A 2,500 bbl. Alco Vacuum Distillation Unit and a 2,000 bbl. Atmospheric Rerun Unit are installed in this country. Reduced Commodoro Rivadavia Crude is charged continuously to the Vacuum Unit, and overhead distillates of gas oil, light, medium, and heavy paraffin oil and asphaltic residuum are recovered.

•

ENGLAND—Here, Alco has designed and built a 2,200 bbl. Atmospheric Distillation Unit, and a 900 bbl. Reduced Crude Vacuum Distillation Unit charging Peruvian Lobitus Crude.

•

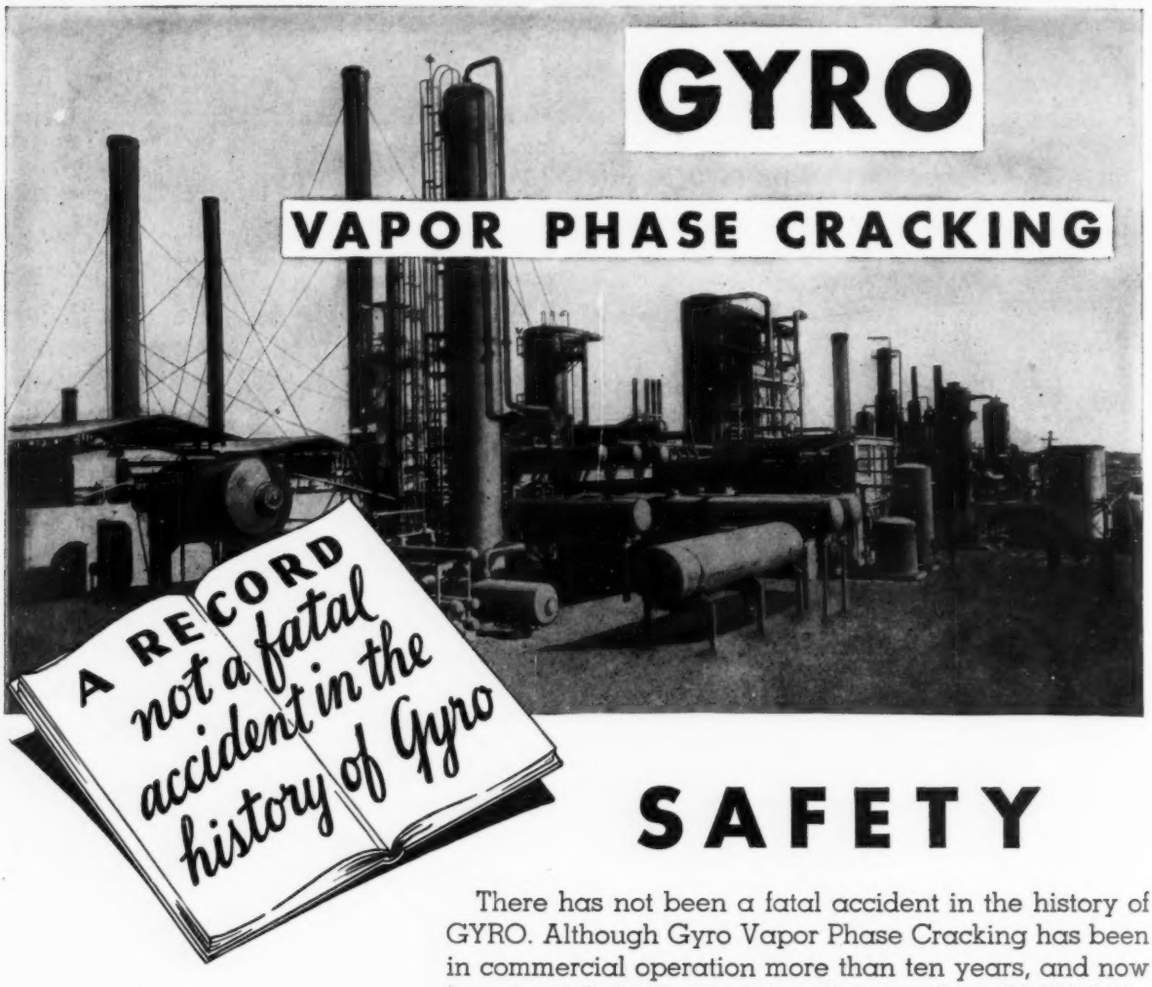
U. S. S. R.—Important Alco installations include two 10,000 bbl. Two-Stage Atmospheric and Vacuum Distillation Units at Grozni, for processing 36-38 A. P. I. Gravity Grozni Mixed Base Crude; and five 6,000 bbl. (each) Single Stage Vacuum Distillation Units charging Reduced Bibi Eibat Low Cold Test Crude at Baku.

•

JAPAN—A 1,500 bbl. Gyro Cracking Unit, and an Osterstrom Liquid Phase Clay Treating Plant together with a Polymerization Unit, represent Alco's installations of recent date. A complete Gas Recovery System is included with the above for the extraction of high volatile gasoline.

Alco Engineering Service is available to design refinery plants to meet unusual requirements. Research and development is constantly being carried on at the semi-commercial Alco experimental unit at Dunkirk, New York.

Alco is licensed to build Gyro Vapor Phase Cracking Units, Gray Vapor Phase, Osterstrom Liquid Phase, R. K. Stratford Continuous Slurry Treating Plants, C. W. Stratford Acid Treating Process for Desulphurization of petroleum distillates.



SAFETY

There has not been a fatal accident in the history of GYRO. Although Gyro Vapor Phase Cracking has been in commercial operation more than ten years, and now has a total daily capacity of more than 60,000 bbls. divided among nearly 40 plants, there has never been a fatal accident caused by failure of equipment.

Safety is a positive characteristic of Gyro Vapor Phase Cracking — a direct result of low operating pressures.

High yields of high volatility, high octane gasoline, produced by a process noted for its flexibility and safety, should make an ideal combination of qualities and features attractive to refiners.

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DIVISION OF
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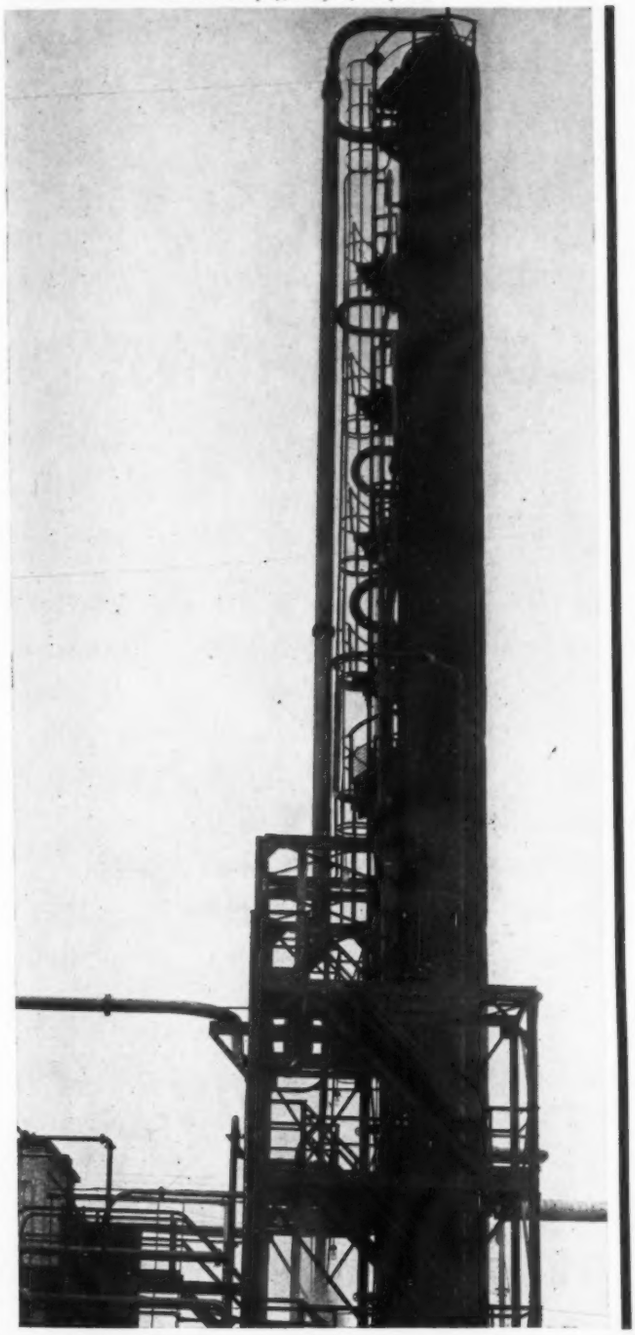
LICENSING AGENTS *for Gyro Vapor Phase Cracking, Gray Process Clay Treating, and Stratford Acid Treating System.*
ENGINEERING, DESIGN, FABRICATION, ERECTION *of Gyro Vapor Phase Cracking Plants, Atmospheric and Vacuum Distillation Units, Tube Stills, Fractionating Towers, Treating Plants, Gasoline Absorption, Stabilizing and Debutanizing Plants, Fluor Cooling Towers, and all types of Heat Exchange Equipment.*

NRA MEMBER U.S. WE DO OUR PART

Close-up of dependable Eagle Insulation in service on Alco equipment at the Canfield Oil Company, Caraopolis, Pennsylvania.



ALCO EQUIPMENT PROTECTED WITH EAGLE INSULATING MATERIALS

● In selecting insulation for this Alco equipment, Eagle Insulating Materials were specified. The full Eagle line, both plastic and blanket, has a reputation among refiners for making good on the job.

● Outstandingly successful is Eagle "66" Plastic Insulation. This material has exceptional efficiency up to 1800° F., minimum shrinkage and cracking; is easy to apply, 100% reclaimable.

● Where a flexible product is needed, Eagle Blanket Insulation is recommended — Eagle Insulating Wool felted and secured between metal fabrics. It withstands high temperatures and vibration without breaking down and comes in sizes and styles to meet all demands.

● To make sure of a good insulating job, use Eagle Insulating Materials and Contracting Service.

● The Eagle-Picher Lead Company manufactures a full line of insulating materials, effective for a complete range of temperatures.

Eagle "66" Plastic Insulation
Plastic insulation, easily applied, extremely efficient up to 1800° F.

Eagle Blanket Insulation
Insulating wool felted and secured, for boilers, breeching, oil refinery equipment, furnaces.

Eagle Insulseal (waterproofing cement)
Durable coating protects all heat insulation against deterioration.

Eagle Stalastic (boiler setting cement)
Tough, rubbery plastic, eliminates air infiltration through masonry boiler furnace walls.

Eagle Fireproofing Concrete
High grade finishing cement, gives exceptionally smooth, durable, white finish.

Eagle "99" Finishing Cement
Easily applied, efficient, adheres to hot or cold surfaces, dries hard, durable.

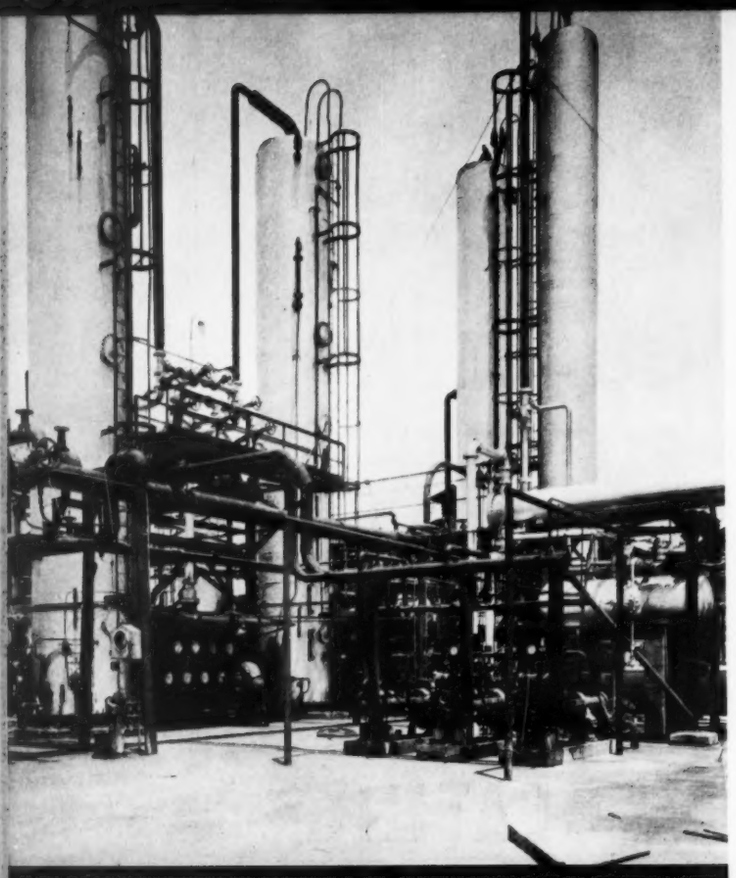
Eagle Asbestos Lumber
Structurally strong; fireproof; resists heat and weather.

Eagle "77" Pipe Covering
Insulating wool felted and secured, flexible and easily applied; particularly adapted for hot lines where a cement finish is desired.

EAGLE INDUSTRIAL INSULATION

THE EAGLE-PICHER LEAD COMPANY

DEPT. 000, CINCINNATI, OHIO



IN MEXICO
Chapman Valves insure long life and low maintenance costs in the new cracking plant at Tampico, Mexico, erected by Alco Products, Inc.

FROM Tampico

ALCO BUILDS WIT

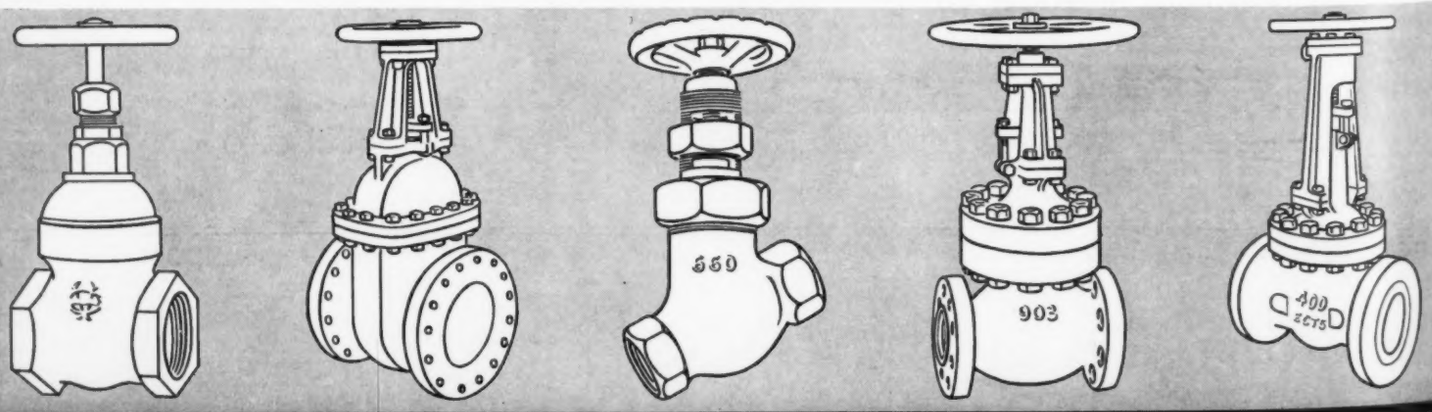
These new Alco-designed refineries in Russia, Mexico, a the United States embody the latest process developme and all are built for peak efficiency. To maintain this efficie and to keep replacements and maintenance at rock botto the designers selected the best in plant equipment. For val they picked Chapman.

It's the same throughout the Oil Industry. Wherever val must stand up under high pressures, intense heat or cold a the destructive effects of corrosion, the preference is stro

The CHAPMAN VALVE

MANUFACTURING COMPAN

A FULL LINE OF REFINERY VALVES



Chapman Bronze Valves for working pressures to 350 pounds.

Chapman Iron Body Gate Valves for 150 pounds pressure.

Chapman Forged Steel Globe, Angle and Check Valves for pressures to

Chapman Cast Steel Globe Valves for pressures to 1500 pounds and temper-

Chapman Chrome Tungsten Steel Gate Valves for corrosive service with pressures to 1500 pounds

...to Baku...

...with CHAPMAN VALVES

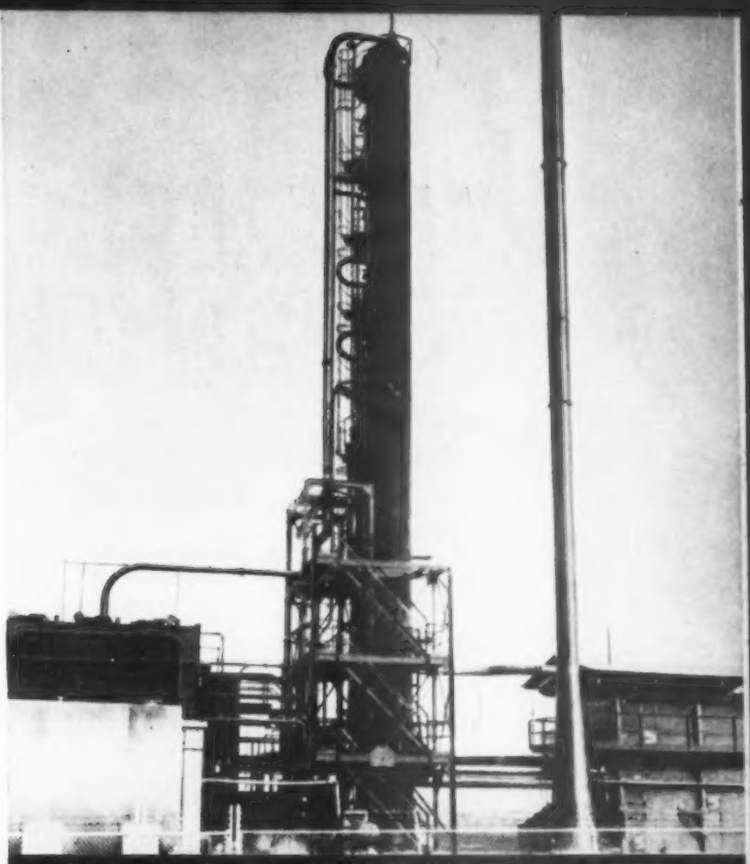
...Chapman Valves. For Chapman has developed valves for ...ry specific refinery and gasoline plant application.

...matter how tough your service, you will find Chapman ...ipment built to fit . . . a complete line of gate, globe, ...le, and check valves and fittings, in all sizes, for pressures ...150 to 1500 pounds and temperatures from 50 degrees ...ow zero to 1000 degrees above. For low maintenance costs ...ow the example of the world's leading refiners and write ...apman" into your valve specifications.

NRA MEMBER U.S. WE DO OUR PART

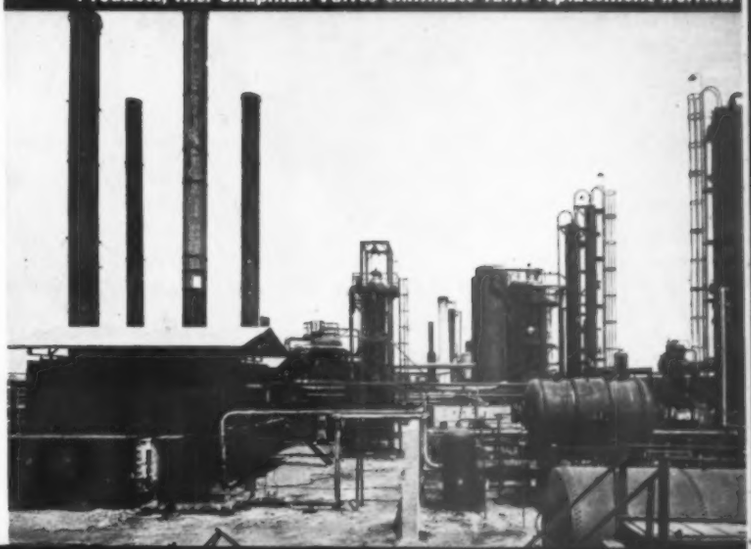
CHAPMAN VALVES DISTRIBUTED FROM ALL PRINCIPAL OIL CENTERS

...DIAN ORCHARD *Massachusetts*

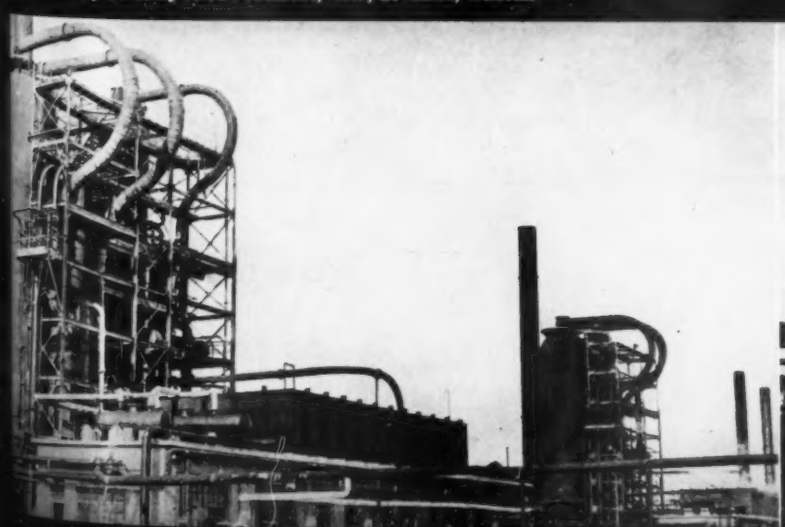


IN U. S. A.
New refinery at Coraopolis, Pennsylvania, U. S. A., built by Alco Products, Inc., for the Canfield Oil Company. Efficient operation further assured by use of Chapman Valves.

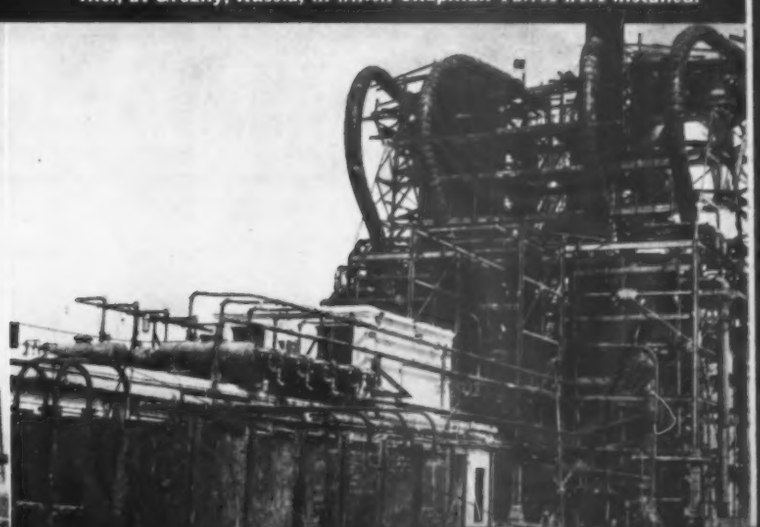
IN U. S. A. — Below
Spartan Refinery at Shreveport, Louisiana, U. S. A., designed by Alco Products, Inc. Chapman Valves eliminate valve replacement worries.



IN RUSSIA
Chapman Valves were used throughout this new 12,000 barrel refinery recently built by Alco Products, Inc., at Baku, Russia.



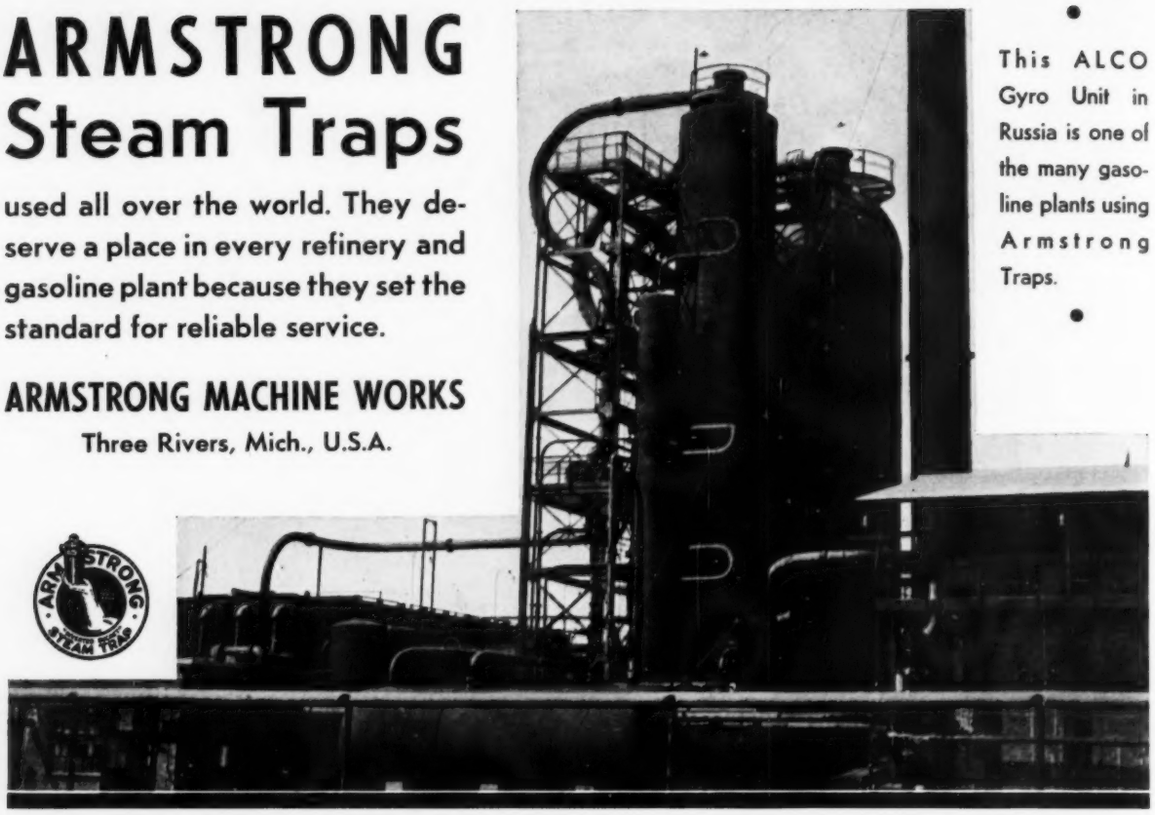
IN RUSSIA
Photograph taken during the erection of a refinery by Alco Products, Inc., at Grozny, Russia, in which Chapman Valves were installed.



ARMSTRONG Steam Traps

used all over the world. They deserve a place in every refinery and gasoline plant because they set the standard for reliable service.

ARMSTRONG MACHINE WORKS
Three Rivers, Mich., U.S.A.



This ALCO Gyro Unit in Russia is one of the many gasoline plants using Armstrong Traps.

ALCO HEAT EXCHANGERS

ALLEGHENY PRODUCTS

Sheets: For Automobile Bodies, Metallic Furniture, Deep Drawing . . . **Allegheny Metal** . . . **Allegheny Alloys** . . . **Electrical Sheets** . . . **Steel Castings** . . . **Seamless Tubing** . . . **Boiler Tubes** . . . **Pipe**

THIS bundle of seamless tubing is an inside view of an Alco Heat Exchanger manufactured by the Alco Products, Inc. of New York City. These tubes are made by the exclusive Allegheny forged, drawn and annealed process which assures a tubing that is not only scaleless but more durable and easier to fabricate.

Allegheny Exchanger Tubes are manufactured from carbon steels, 4 to 6% chrome, with or without molybdenum or tungsten, Allegheny 66 and Allegheny Metal depending on the corrosion and temperature condition.

ALLEGHENY STEEL CO. . . . BRACKENRIDGE, PA.
Sales Offices and Warehouse Stocks in the Principal Cities

1934 Edition

REGISTER OF TANK VESSELS

This valuable tankship reference work prepared by the Standard Shipping Company (Standard Oil Company of New Jersey) contains detailed data of more than 1,400 ocean-going tankers, together with a list of the owners and managers. Freight rates for 1922 to 1933 are also given. Order your copy now.

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TUBES and SUPPORTS in ALCO-GYRO STILLS

HEAVY DUTY CALORIZED TUBES

General:

Calorized seamless steel tubes render the refiner valuable service in Alco-Gyro stills because of their immunity to the attack of agencies which result in rapid deterioration of plain steel tubing. The iron-aluminum alloy surface is entirely immune to oxidation up to maximum metal temperatures of 1650 degrees F. and is not attacked by high sulphur crude oil. In present-day Heavy Duty Calorizing the surface alloy is tough and thoroughly bonded to the steel, presenting great resistance to erosion and tube cleaner wear.

Sulphur Corrosion Resistance:

Table I exhibits the great resistance of Calorized tubes to sulphur corrosion. For comparison we have included data on un-Calorized specimens on all currently available tube steels.

TABLE I

Gain in Weight — Milligrams Per Sq. CM.

Type of Material	24 Hours — 1200 °F. in Hydrogen Sulphide		1200° F. — Air 1000 Hours	
	Plain	*Calorized*	*Plain*	*Calorized*
18–8 Tubing	37.3 35.7	0.1 0.1	1.1	0.52 0.75
Timken D-1	107.1 113.0	1.0 0.2	56.5	2.25 1.42
4–6% Cr. 1% Tungsten	175.7 175.4	0.5 0.5	17.5	1.58 1.40
4–6% Cr. 0.45%–0.65% Molyb.	175.4 170.1	1.0 1.6	36.6	0.88 0.71
4–6% Cr.	190.8 175.9	0.2 0.8	39.5	0.56 0.71
Carbon-Molybdenum Molybdenum 0.50%	123.4 94.6	0.3 0.3	83.6	0.99 0.94
Plain Low Carbon Steel	189.0 167.1	0.5 0.6	70.8	0.80 0.92

NOTE — None of the Calorized samples showed attack either by oxidation or sulphur corrosion. The slight gain in weight on Calorized specimens results from formation of a protective surface film.

Wear Endurance:

Recently, at a prominent mid-western refinery, a Heavy Duty Calorized tube was subjected to repeated passes of Turbo head and knocker type cleaners. Officials of the refinery estimated this accelerated wear test to be equivalent to four years of ordinary cleaning in service.

Under the action of the cleaner, the Calorized tube showed no wear which could be measured with micrometers. A mild steel tube subjected to the same test showed a loss of 1/32" in wall thickness, the tube interior being badly cut and gouged.

Oxidation Resistance:

Table I presents oxidation resistance of Calorized tubes in comparison with all other available still tube steels. The ability of Heavy Duty Calorizing to prevent oxidation, thus maintaining the full wall section intact, is amply evidenced.

Bursting Strength:

Where conditions of pressure and temperature demand greater strength than provided by mild steel, Heavy Duty Calorizing may be applied to a number of low priced, high strength alloy steels.

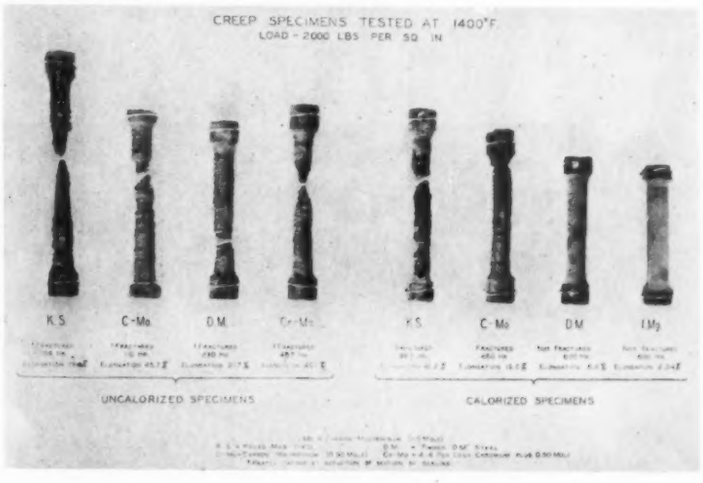
Table II gives long time creep values on these steels compared to other available still tube materials. The photograph covering specimens used in one of these tests graphically illustrates the superiority of the Heavy Duty Calorized tube.

TABLE II

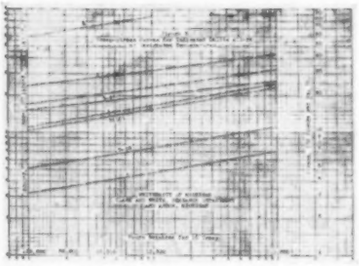
CREEP VALUE — 1% — 10,000 HOURS

(Clark and White — University of Michigan)

	1000°F.	1100°F.	1200°F	1300°F
Mild Steel: Plain Steel	6800#	1400#		
Calorized Steel		2050#		
4–6% Chrome (0.50% Molybdenum)	10250#	5000#	2500#	
Calorized Carbon-Molybdenum (0.50% Molybdenum)	15800#	7000#	1650#	840#
Calorized Carbon-Molybdenum (1.00% Molybdenum)		8000#	2600#	2000#
Calorized Timken "DM"		6800#	3950#	1800#



CALITE TUBE SUPPORTS



General:

The Calite Alloy Steels are a group of heat-enduring materials developed to serve specific purposes. No single steel, however excellent, can serve in all applications. For example, certain metals may readily withstand oxidation up to temperatures of 2000° F. but are rapidly attacked when constantly in contact with gases which contain appreciable amounts of sulphur compounds. Again, beams and similar parts required to sustain a load at high temperature must possess unusual stiffness at the operating temperature in addition to oxidation resistance.

For this reason, The Calorizing Company has developed a series of heat-enduring alloy steels available in the form of castings, sheets, shapes and forgings with particular reference to commercial requirements.

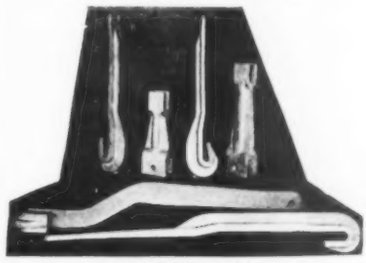
High Temperature Creep Strength:

The need for accurate data on the high temperature strength of heat-enduring castings as an aid to safe design of beams, plates and other load-carrying members in oil still construction has long been realized.

To fill this need we commissioned the Engineering Research Department, University of Michigan, to determine long time creep values of all Calite Alloys. The above graph is taken from University Report 3-B, Project 775, which will be mailed upon request.

Creep data on these alloys in the range 1600°–2000° F. are of particular value to the still designer.

ALCO-GYRO STILL
Spartan Refining Co., Shreveport, La.



ALCO-GYRO STILL
Anglo-Mexican Pet. Corp., Tampico, Mexico

THE CALORIZING COMPANY

PITTSBURGH, PA., U. S. A.

BOLDEJ STEPS

"At Home Abroad"—Scotland, Persia and the Dutch East Indies, from Maine to California, and from Hudson Bay to the Gulf—Kerlow Products have proved dependable, fireproof, rigid, non-slip, combining good looks with sanitary efficiency.

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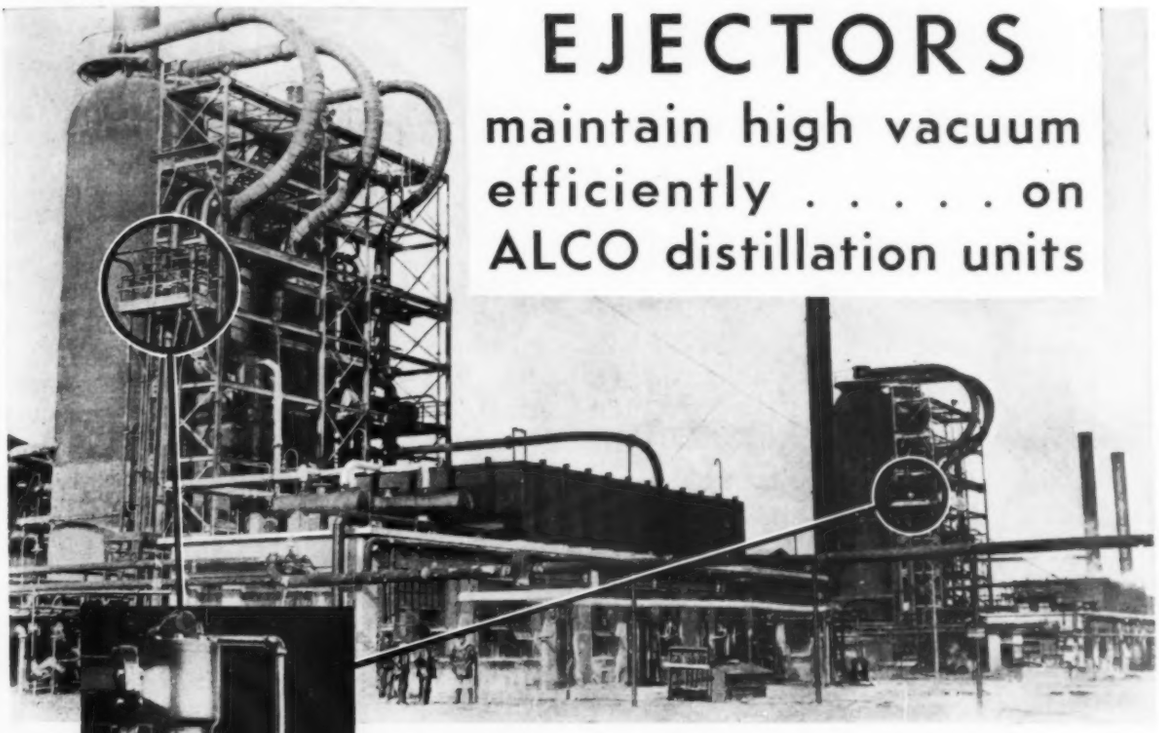
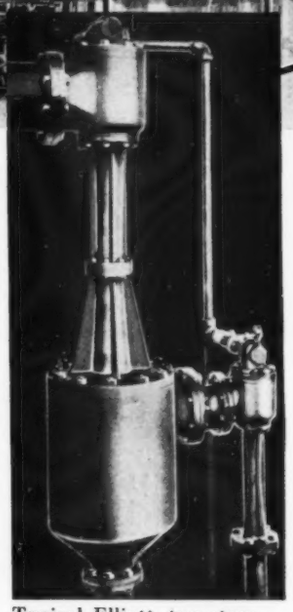
ELLIOTT
STEAM JET
EJECTORS
maintain high vacuum efficiently . . . . . on ALCO distillation units

Elliott two-stage ejectors serving Alco 10,000-bbl. two-stage distillation units in Grozny, Russia.





Typical Elliott two-stage steam jet ejector. These units are supplied in all sizes, with condensers of either surface or jet type.

Elliott ejectors are maintaining the vacuum on Alco units in various refineries in Russia, the Argentine Government Oilfields, Lobitos Oilfields, Ltd., England, etc.

In simple and compact units, Elliott ejectors produce vacuum as high as required on any distillation process. Their installation is simplicity itself. Maintenance is practically nothing, since nothing moves in them, but the steam. They need literally no attention. They get high vacuum with minimum steam and water requirements.

Elliott ejectors are a distinct asset to any vacuum unit.

The experience of Elliott engineers in applying ejectors for all vacuum requirements is unparalleled. Ejectors and condensing equipment can be furnished in a broad range of sizes and types to fit all conditions.

ELLIOTT COMPANY
PITTSBURGH, PA.
Heat Transfer Department JEANNETTE, PA.
District Offices in Principal Cities

NRA WE DO OUR PART G-326

PIONEERS IN THE DESIGN, CONSTRUCTION AND APPLICATION OF STEAM JET EJECTORS

This Special High Speed Explosion-Proof Motor

operating at 10,000 R.P.M. drives the Alco-Stratford centrifugal extractors referred to in the "Alco" section of this magazine.

The manufacturer writes us—"The process is a continuous 24-hour a day operation—the units have been running for at least 5,000 hours continuous without a failure of any kind—we feel this is quite a testimonial—we believe this is a record—"

Send us your electric motor problems—our 34 years' experience designing and building special motors is at your disposal.

THE LOUIS ALLIS CO., Milwaukee, Wis., U. S. A.

A PRODUCT IS KNOWN BY THE COMPANY IT KEEPS

For more than seven years TUBE-TURNS have been giving dependable and efficient service in America's leading refineries.

And among the makers of Refinery Equipment, some of the finest names in the Industry — Alco Products, Inc., for example — have long been listed as users of these superior welding fittings.

TUBE-TURNS, INC.
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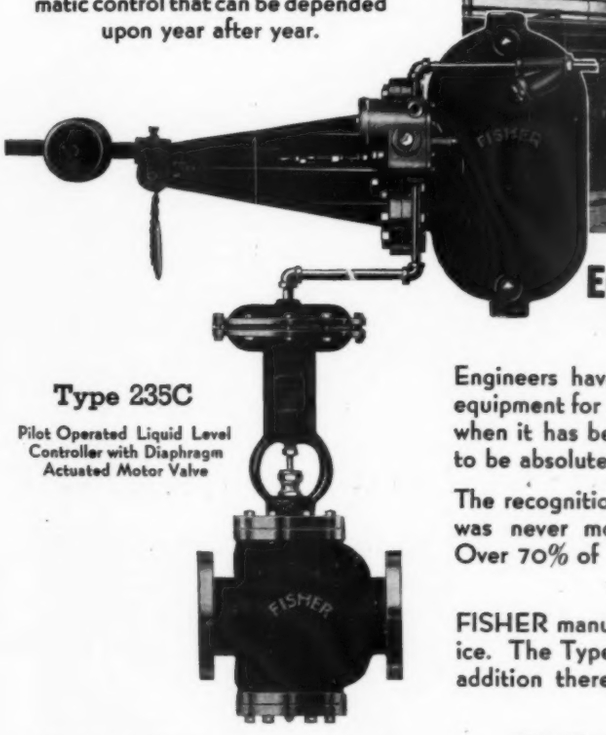
ALCO

Two names well known throughout the world—ALCO and FISHER. For many years Alco engineers have depended upon FISHER controls for successful automatic control of pressures and liquid levels.

FISHER

Whether it is in Russia, Italy, France, Argentine, United States, or other countries FISHER will be found there and giving automatic control that can be depended upon year after year.



Type 235C

Pilot Operated Liquid Level Controller with Diaphragm Actuated Motor Valve

The new FISHER Catalogue 34-A gives detailed information on the Complete FISHER Line and includes data book on valve body capacities. Write for your copy.

Engineers Recognize FISHER Reliability as Proved by Their Demands

Engineers have never been more careful in their selection of equipment for refinery construction than in the past few months when it has been necessary to hold costs to a minimum but to be absolutely certain dependable equipment was installed.

The recognition of the reliability of FISHER Level Controls was never more concretely proved than during this time. Over 70% of the construction in the Petroleum Industry has used FISHER LEVEL Controls.

FISHER manufactures a Level Control for every type of service. The Type 235C Remote Controller is shown at left. In addition there are direct operated types with either internal or external float construction.

Fisher Governor Company

1013 SANTA FE AVENUE, LOS ANGELES, CALIF. — FISHER TRADE MARK — 50 CHURCH STREET, NEW YORK, N. Y.

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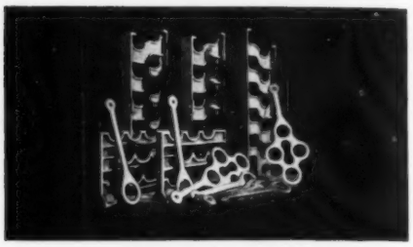
AMSCO ALLOY TUBE STILL SUPPORTS WERE SUPPLIED AT THE ALCO BUILT PLANT of the SPARTAN REFINING COMPANY



A group of typical AMSCO ALLOY Steel oil still tube support castings

AMSCO ALLOY

an established, time-tested series of cast nickel-chromium alloys is made for resisting heat, corrosion or acids. Available in six different analyses. When applied according to our recommendations AMSCO ALLOY does not Burn, Bend, Crack, Warp, Scale or Corrode.

AMSCO ALLOY is applicable to a wide range of industrial uses.

American Manganese Steel Company

General Sales Offices + Chicago Heights, Illinois

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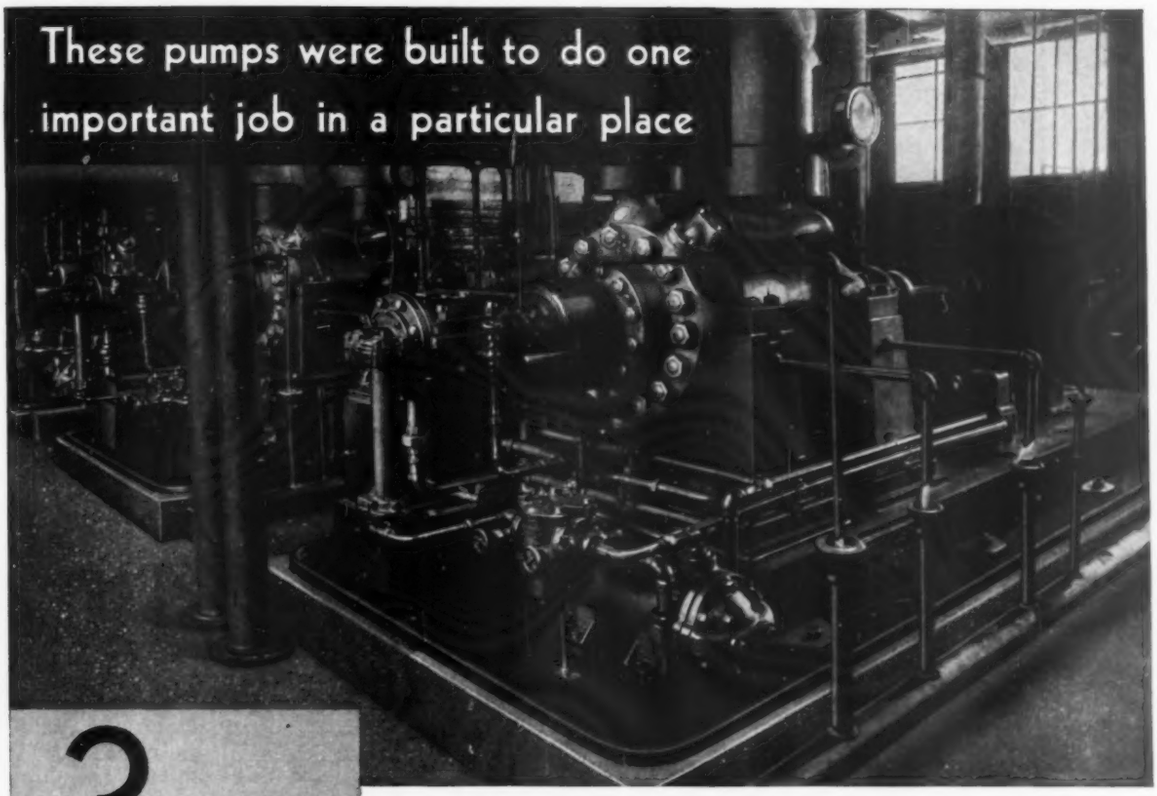
These pumps were built to do one important job in a particular place



3 CAMERON HOT-OIL CHARGING PUMPS in NEW Spartan Refinery

The Cameron "AHT"

Withstands high pressures, high temperatures, and corrosive action of oils.

Has water-cooled stuffing boxes under suction pressure.

Is safety-sealed against hot-oil leakage and escape of fumes.

Has provision for expansion caused by high oil-temperatures.

Permits easy inspection and renewal of wearing parts.

Will handle new operating conditions efficiently by a change of impellers and diffusors.

Can operate close to maximum coil pressure because of its smooth, nonpulsating action.

Is ideal for bringing coil up to temperature when starting or taking coil off stream.

Recognizing the fact that hot-oil charging — handling hot, corrosive oils at temperatures up to 750° F. and pressures up to 2000 pounds—is the most severe pumping service encountered, Cameron has designed and built the "AHT" line for that *one* purpose.

Aside from incorporating many specially developed features, each Cameron "AHT" is designed to meet the hydraulic conditions, exactly and efficiently. It is built of materials which have been found to best withstand the action of the particular charging stock used.

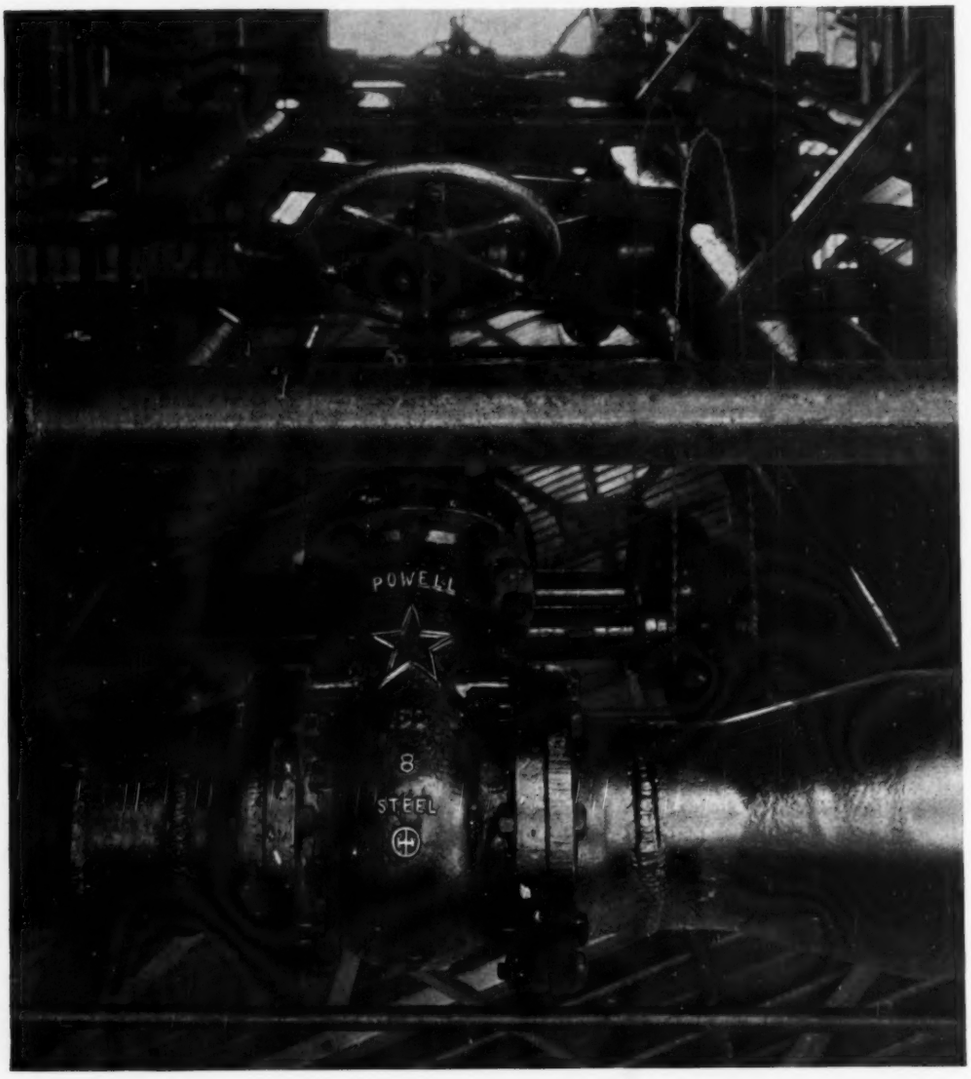
10,000 hours' operation at 100% availability is typical of "AHT" performance in refineries throughout the country. The "AHT" has high efficiency and maintains it.

Such records *sold* the three 5-stage pumps shown above. They were built for the new Spartan refinery, which uses the Alco Gyro-Vapor phase process. Pumps sold to your refinery will be built for your refinery.

93-10

Ingersoll-Rand

CAMERON PUMP DIVISION
11 Broadway, New York, N.Y.

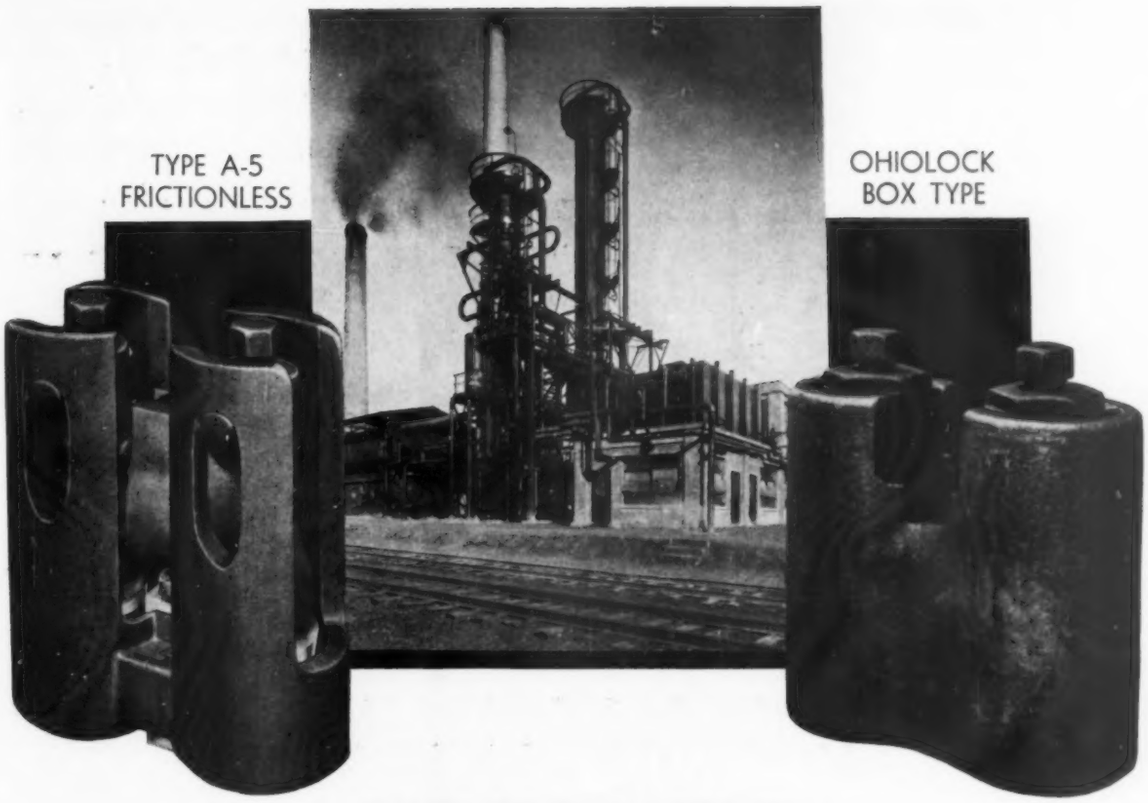


Powell Cast Steel Gate Valves were used on the Gyro gas lines in the compression house of the Spartan Refinery, Shreveport, La. This gas plant will handle five million cubic feet of cracked gases per day.

Powell Cast Steel Valves . . . like all Powell products . . . are designed to withstand exacting requirements of individual plant operation. They are made in gate, globe, angle, check and safety non-return patterns, for working pressure ranging from 150 to 1500 pounds. A variety of trim materials permits the use of the material best suited for air, oil, water, gas or steam service.

THE WM. POWELL CO. • 2525 SPRING GROVE AVE. • CINCINNATI, OHIO

POWELL VALVES



DEPENDABLE "OHIO" RETURN BENDS

Here are two popular types of "Ohio" Return Bends

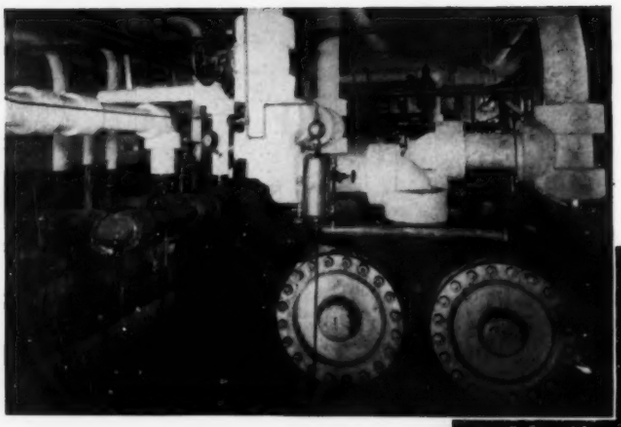
The Type A-5, a full streamline fitting, incorporates the single tube replacement feature with a special housing connecting device. This connection, while providing the necessary flexibility, holds the seats in proper alignment both laterally and longitudinally, eliminating expensive realignment after tube cleaning.

The other type shown is the standard box type, with Ohiolock top. Thousands of these fittings, some with this type top and others with mule ear top, are giving excellent results.

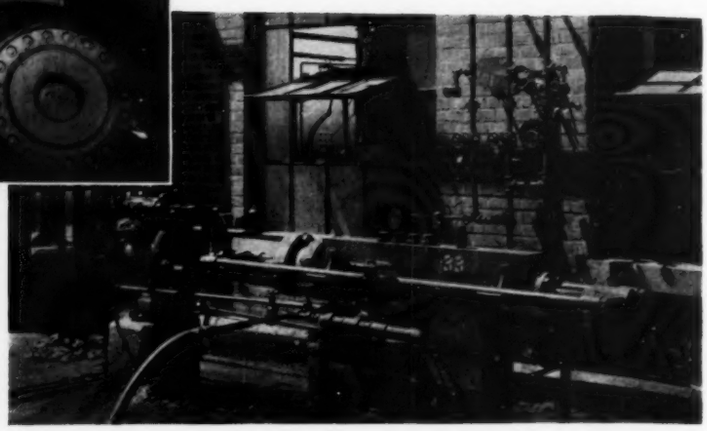
Both fittings have through years of service established their reputation for dependability.

Let "Ohio" engineers submit their recommendations

THE OHIO STEEL FOUNDRY COMPANY
SPRINGFIELD . . . . OHIO



TRANSIT Direct Acting Steam PUMPS are used in the ALCO built plant of the SPARTAN REFINING COMPANY at SHREVEPORT, LA.

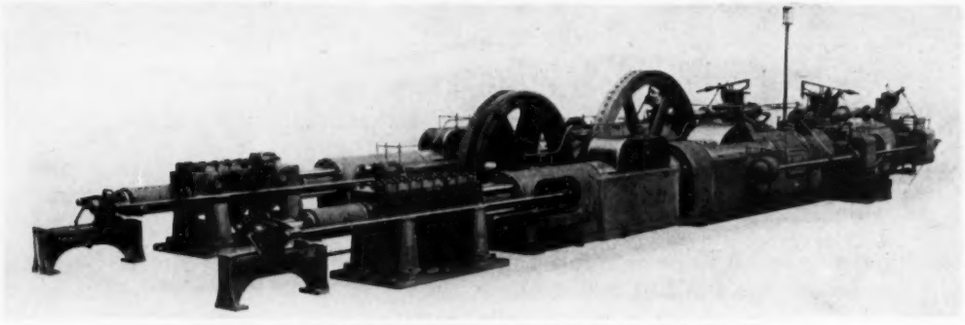


THERE IS A TRANSIT PUMP FOR EVERY REFINERY SERVICE AND FOR . . .

LOWEST POSSIBLE OPERATING COSTS with ABSOLUTE DEPENDABILITY

TRANSIT GAS ENGINE DRIVEN HOT OIL and CHARGING PUMPS operating on REFINERY GAS have been proved by years of service

ONE Refinery Superintendent, with three Transit Gas Engine Driven Units in operation, says: "It does seem to me that very few refiners will install steam driven pumps to operate a cracking plant when the cracking plant itself provides gas which can be used for operating gas engine driven pumps at much less cost than by using steam."



Transit 17" x 24" Twin Tandem Single Acting Four Cycle Gas Engine and Transit 4 5/16" x 24" Horizontal Duplex Plunger Pump with Forged Steel Fluid Ends, for Hot Oil Service

SINCE the first Transit Gas Engine Driven Hot Oil Pump was installed six years ago, there has never been a shutdown due to engine or pump failure, and due to the success of this first installation four additional units have been installed by this one company alone.

DETAILED INFORMATION REGARDING THIS TYPE OF PUMP AND ITS COST OF OPERATION WILL BE GLADLY FURNISHED

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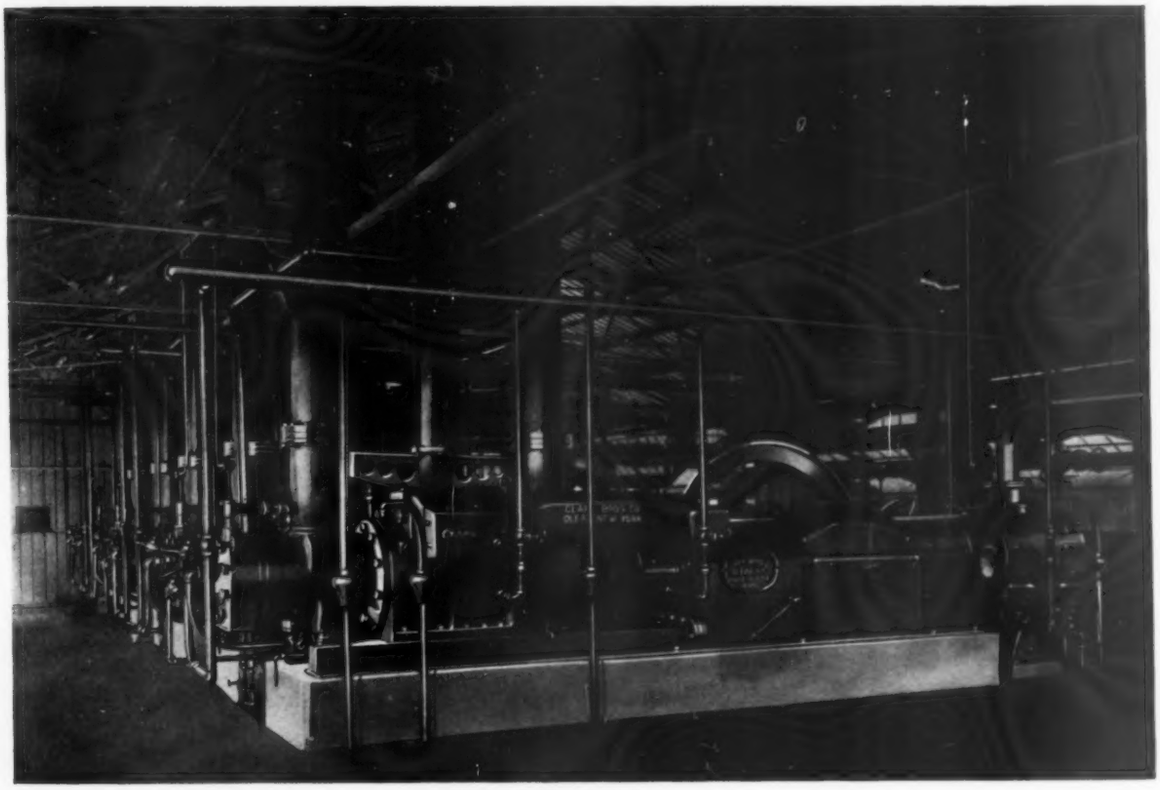
NEW YORK • • CHICAGO • • HOUSTON • • CLEVELAND • • PITTSBURGH • • TULSA • • LOS ANGELES

CLARK

GAS ENGINE DRIVEN COMPRESSORS FOR MAXIMUM ECONOMICAL RECOVERY OF CRACKING STILL GASES



CLARK 400 H.P. GAS ENGINE DRIVEN COMPRESSORS USED IN THE ALCO BUILT GYRO CRACKING PLANT OF THE SPARTAN REFINING COMPANY.

30,160 H.P. of Clark compressors are now operating in American Refineries. They are designed to meet the exacting requirements of refinery service.

Clark compressors are available for electric, steam, oil and gas drive. Also vertical gas engines for generator service.

CLARK BROS. COMPANY, OLEAN, NEW YORK

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Standard Oil Company, Toledo, Ohio. Carey Heat Insulation extensively used.

Insulation By Carey

QUITE naturally, individual members of the Petroleum Industry have marked preferences for different processes and types of equipment used in transforming crudes to finished products. But whether the installation is by Alco, Badger, Foster Wheeler, Kellogg, Lummus, McKee, Universal or Winkler Koch, when the specifications call for—

INSULATION BY CAREY—

there is an assurance that the equipment to be insulated will enable the process selected to perform to the best of its ability, through the conservation and control of heat to the last B.T.U.

INSULATION BY CAREY has been used in the Panhandle and Batum . . . Pennsylvania and Venezuela . . . the Straights Settlements and New Jersey . . . in Aruba and Grozneft . . . Tampico and Tulsa . . . the Argentine and Japan . . . wherever black liquid gold is found and refined.

INSULATION BY CAREY includes blocks, sheets and cements for all temperatures up to 2000°F. . . . Asbestos and Magnesia Pipe Coverings . . . Rock Wool Blankets . . . Alumino Hi-Temp Blocks and Bricks . . . 606 Cement for monolithic construction . . . Thermotex waterproof coatings . . . Asbestos and Asphalt felts and fireproof sheets and lumber . . . and pipe line felts.

Bulletins 101A and 104X should be in the files of every man who is specifying or buying heat insulation. These bulletins contain complete tables showing the most efficient insulation or combination for all temperature ranges. A request will bring them by mail.

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FOREIGN TRADE DIVISION
44 WHITEHALL STREET, NEW YORK, N. Y.
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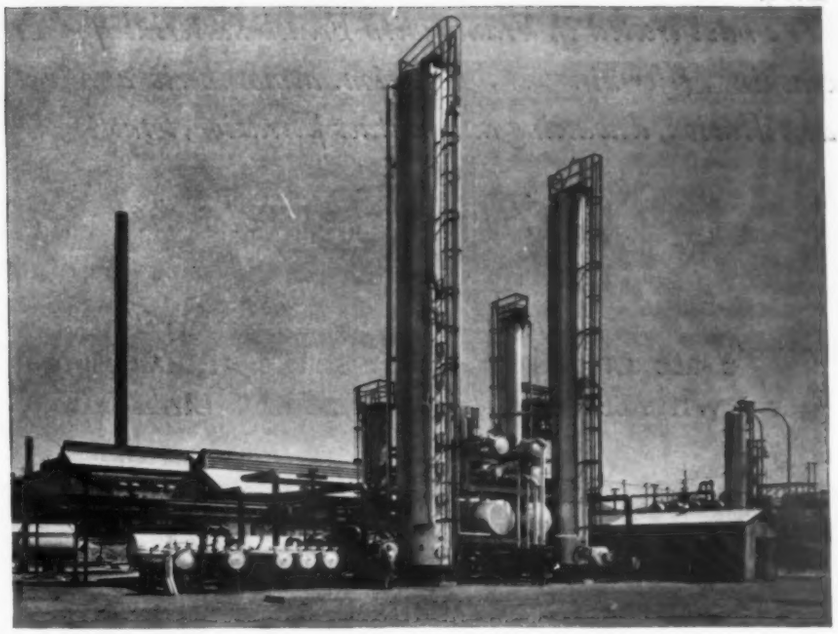

Alco Vapor Recovery Plant designed and built for a large American refinery.

ALCO FRACTIONATING and RECOVERY UNITS INSURE SHARP FRACTIONATION and HIGH RECOVERY

RECYCLING IS ELIMINATED OR REDUCED TO A MINIMUM

In the processing of gases, vapors, and light distillates, high recoveries and sharp (close), separations are demanded by modern refining practice. Numerous methods are available but their relative economies vary widely.

Alco Vapor Recovery Plants and Fractionating Units, by eliminating or reducing recycling to a minimum, insure simplicity of performance and greater operating economy.

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DIVISION OF
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ENGINEERING, DESIGN, FABRICATION, ERECTION *of Gyro Vapor Phase Cracking Plants, Atmospheric and Vacuum Distillation Units, Tube Stills, Fractionating Towers, Treating Plants, Gasoline Absorption, Stabilizing and Debutanizing Plants, Fluor Cooling Towers, and all types of Heat Exchange Equipment.*

We have erected in France with French material and French labour plants for cracking, reforming, stabilization, atmospheric and vacuum distillation, re-distillation, dewaxing and contact filtration, totalling a capacity of more than:

70,000 Barrels per day

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We are organized to construct all types of refinery equipment with ITALIAN material and ITALIAN labour

IN ITALY

DISTILLATION, CRACKING, REFORMING, STABILIZATION UNITS, PLANTS FOR THE MANUFACTURE OF LIQUEFIED GASES, etc.

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SEMI-INDUSTRIAL REFINERY AND LABORATORY AT BEYNES

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LA TECNICA ED I PROCEDIMENTI PIU RIPUTATI SARANNO ADATTATI AI BISOGNI NAZIONALI CON MATERIALE E MANO D'OPERA ITALIANA.

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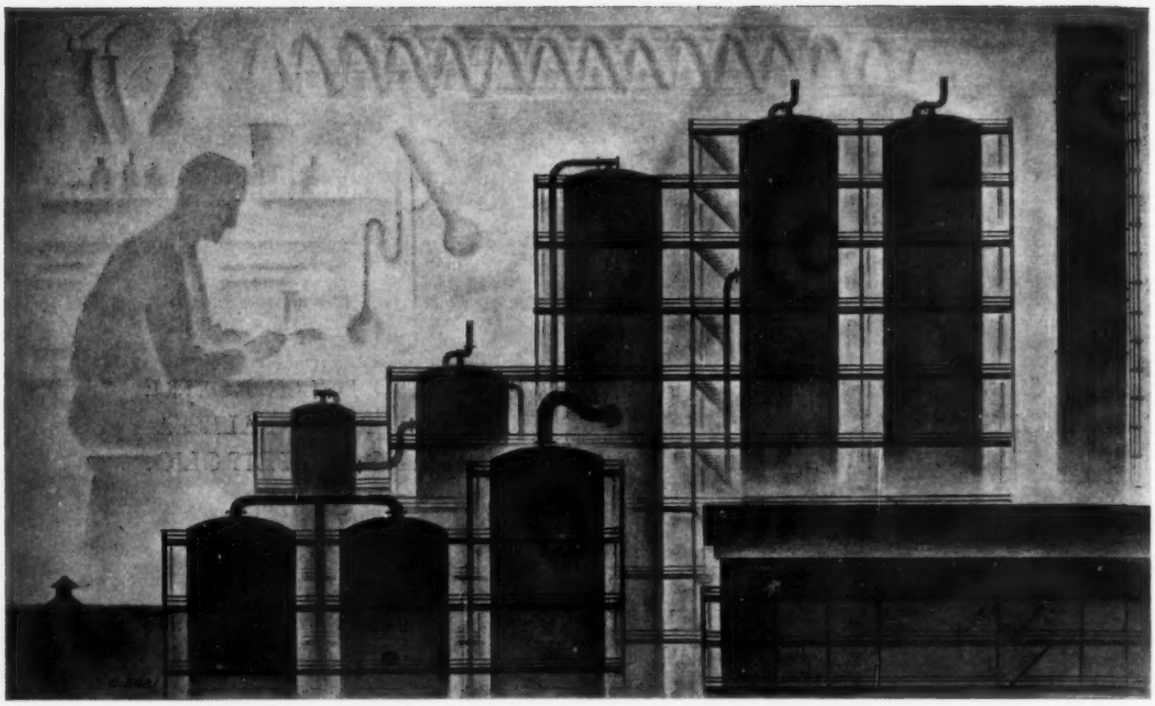
LABORATORIO ED IMPIANTO SEMI INDUSTRIALE DI RAFFINERIE IN EUROPA A BEYNES



INTEGRATED PROGRESS IS THE RESULT OF RESEARCH

LICENSES granted under United States and Foreign Patents for: Cross • de Florez • Holmes-Manley • Tube and Tank Cracking Processes and Combination Cracking Units.

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The broad licensing rights of Gasoline Products Company offer refiners the benefits of integrated progress. Through this organization the engineering developments of several major refineries are coordinated. Laboratory research is conducted under the supervision of research workers and engineers familiar with practical refining methods. The cumulative experience and operating data of refineries processing various crudes in many parts of the world is also available.

Through this policy of integrated progress combination units are designed incorporating one or more of the outstanding features of several processes. These units assure the refiner that the cracking equipment he installs will be suited to his particular requirements.

We suggest that you investigate the broad and comprehensive service of Gasoline Products Company before investing in cracking equipment.

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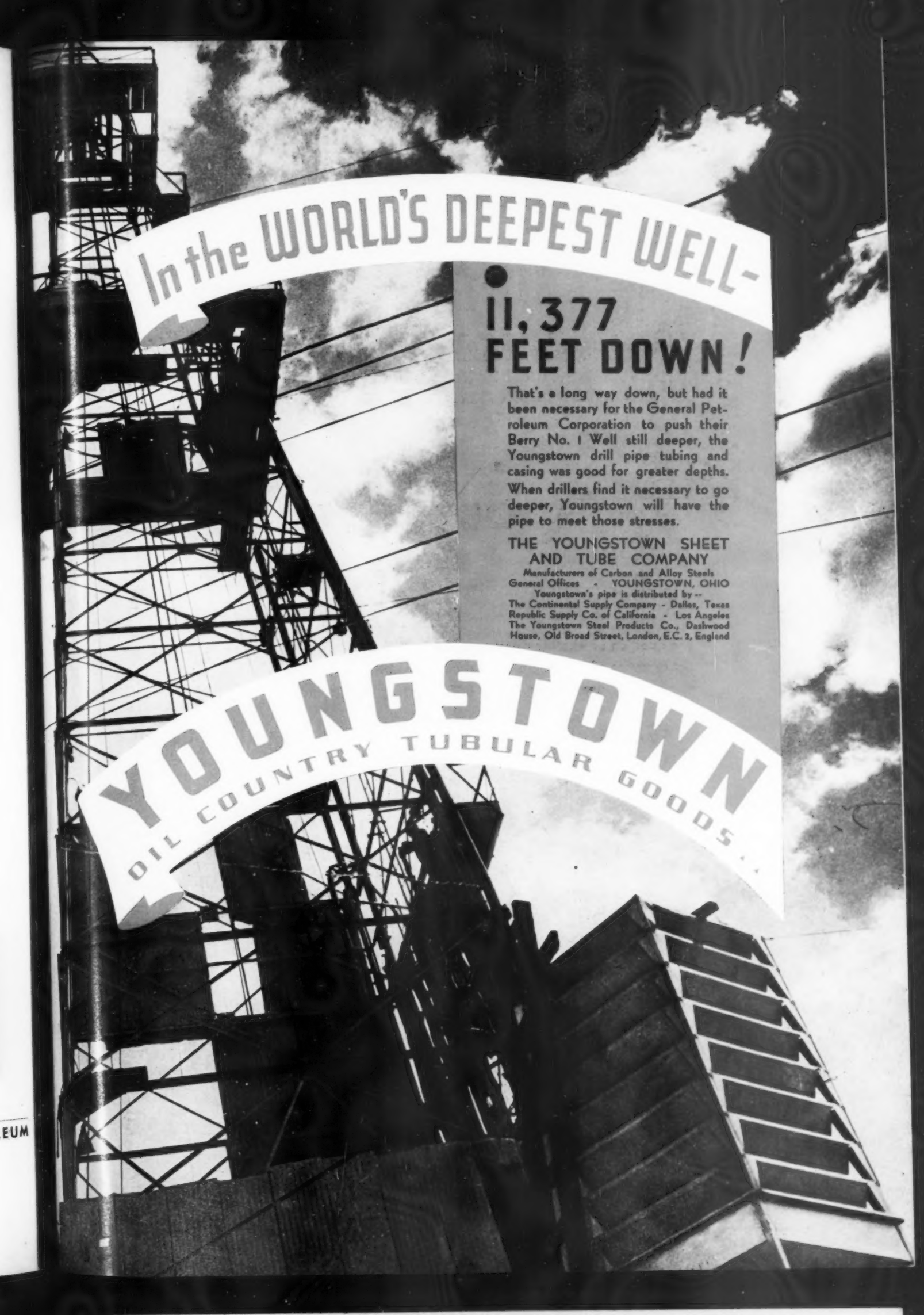
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FEET DOWN!
That's a long way down, but had it been necessary for the General Petroleum Corporation to push their Berry No. 1 Well still deeper, the Youngstown drill pipe tubing and casing was good for greater depths. When drillers find it necessary to go deeper, Youngstown will have the pipe to meet those stresses.
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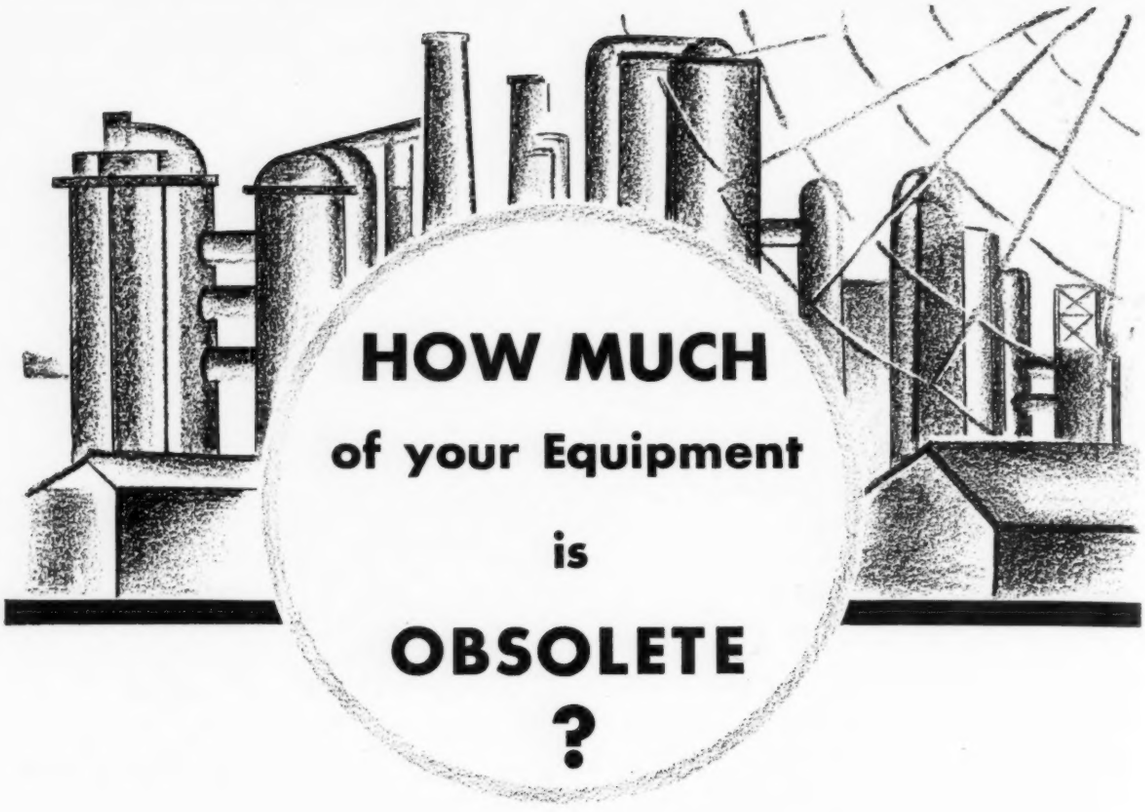

HOW MUCH of your Equipment is OBSOLETE ?

The question of whether refinery equipment should be replaced or modernized is not a matter of the length of time units have been in service. Obsolescence is not measured by years alone. Yields and operating costs, rather than years of operation, determine the useful life of your equipment.

Any but the most efficient equipment is obsolete today, regardless of how short a time it may have been in service. Obsolete... wasteful... adding dollars to production costs... taking dollars from profits.

For refiners desirous of availing themselves of the lowest cost methods of producing high quality lubricating oils, Lummus engineers have some very interesting data. And in the Lummus Laboratory—a complete refinery capable of semi-commercial scale operation—Lummus offers a proving ground in which the refiner may verify the efficiency of new equipment before investing a dollar in new equipment.

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